

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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The "Standard" Grain Scale.

The accurate weighing of grain in transit is a problem to which many inventors have devoted their best energies, though without success, as the varying conditions occurring in practice demand, above all, simplicity in design and durability in construction. One of the difficulties which have hitherto seemed insurmountable has been the adaptation of a machine to uniform weights, with varying rates of delivery, it being comparatively an easy matter to devise a machine to weigh with tolerable accuracy when the flow of grain is uniform. The idea of suppressing the usual method of weighing the grain on platform scales by manual labor, and substituting for it machinery through which it passes in a continuous stream, will commend itself to all. It is this that has been aimed at in the machine shown in the accompanying illustration. The "Standard" Grain Scale, as it is called by the manufacturers, Messrs. Simpson & Gault, of Cincinnati, Ohio, consists simply of an even balance beam, from one end of which, upon knife-edge pivots, is suspended a tilting grain bucket. The bucket is divided into two equal compartments, and is held in position to receive grain by means of gravitating latches, pivoted to the suspenders which hang upon the knife-edge bearings and sustain the bucket. From the opposite end of the beam, upon knife-edge pivots, is suspended, by the usual clevis and hook, the balancing weights. The balancing weights are so arranged that the lower or main weight, in conjunction with the small weight on what is termed the supplemental beam, exactly balances the empty bucket, and the grain weight exactly balances the weight of the grain to be taken in the bucket at each dump. Immediately above the grain bucket is placed the spout, to the upper end of which the spout from an elevator, grain bin or cleaning machine is attached. The spout is gradually tapered to the mouth at the lower end, which consists of a long, narrow opening, through which the grain is delivered into the bucket. Suspended from a small steel shaft, mounted upon the back side of the spout, are two long, narrow plates, the larger of which is known as the main cut-off and the smaller as the drip plate or supplemental cut-off. The main cut-off plate swings under the mouth of the spout in such a manner that the grain resting upon the plate is wiped off by the rear edge of the spout each time the cut-off is withdrawn, and a rib or wiper upon the under side of the main cut-off plate performs a similar service for the drip plate. The cut-off and drip plates are loosely hung upon the steel shaft before mentioned, and are operated by means of fixed clutches upon the shaft. The shaft is rolled up and down, as the forward end of the scale beam rises and falls, by means of lifting toes on the beam and rolling toes on the shafts, the faces of the toes being arcs of epicycloidal curves, in order that perfect rolling contact may be maintained at all points in the motion of the two toes.

When the grain bucket is at the highest point of its travel, both the cut-off and the drip plates are entirely withdrawn from under the mouth of the spout, and the grain flows freely into the bucket. When so much grain as is represented by the difference between the supplemental weight and the grain weight is taken into the bucket, the bucket and forward end of the beam descends a short distance, until the supplemental weight rests upon the beam, when the bucket lacking grain to the extent of the supplemental weight is checked in its downward movement, and pauses until the requisite quantity to complete the load has been taken. Meanwhile, the bucket has been descending the short distance required to anticipate the supplemental weight, the main cut-off plate has closed to its fullest extent, leaving open only a narrow slit, through which the final quantity of grain, necessary to complete the load, is slowly filtered. Directly the grain in the bucket appreciates the resistance of the weight, the bucket descends a slight distance, when the drip plate instantaneously cuts the narrow opening in the spout, and completely checks the flow of grain. The bucket then descends until the latches holding it in position are released by check pieces on the frame of the machine, when it turns on its shaft, quickly discharges the weighed load of grain, and returns to repeat this operation as long as grain is supplied to the scale. The discharge of the grain from one compartment of the bucket presents the opposite compartment for the reception of grain as it rises under the spout. The bucket is at all times freely suspended on its bearings, as is also the weight. The cut-off and drip plates close by gravity, and are entirely independent of the weighing mechanism. The curves on the lifting and rolling toes are true epicycloids and impinge by rolling contact. The rise and fall of the beam on a scale weighing 100 bushels per hour is one-half inch, scarcely as much as in an 8-pound tea scale. The scale can be adapted to weigh flour in uniform dumps of 196 pounds, thereby dispensing with the tedious and expensive method now prevailing—in the weighing of the empty barrel for the tare, and correcting the weight by adding to or taking from the quantity in the barrel—all of which is avoided by means of the Standard scale. Each dump being exactly 196 pounds, 10 stone or 20 stone, according to the trade to be supplied.

The machine, it will be seen, is compactly built, a scale weighing less than 100 pounds at a time occupying a space 20 inches in height, 16 inches in width and 18 inches in length. Such a machine, we are informed, is capable of weighing 2400 bushels of grain per day of 24 hours. One of the special applications of the Standard scale is as a test made in flour mills, where it is extremely important that it should be as accurately known from day to day how much grain is ground as it is to know how much flour is made.

The Publication of Consular Reports.

Some time ago a memorial from the New York Chamber of Commerce was presented in the United States Senate, asking that the reports of our consuls be given more prompt and popular publication, and a resolution was adopted in the House asking the Secretary of State to inform the House what steps could be taken to accomplish the desired object, and what had been done in other countries in this direction. The secretary replies that the best method of making the valuable information in the commercial reports accessible to the public has been the subject of very careful consideration, but that the department's means are insufficient for accomplishing the object in an entirely satisfactory manner. He then gives a list

shared its obscurity. The only way in which news of commercial value now reaches the public without delay is by the publication of short abstracts of the dispatches in the newspapers; but these paragraphs do not appear at regular intervals, have no connection with one another, and are frequently crowded out of the papers by other matter.

The Secretary favors the publication of the information under consideration in pamphlets as frequently as possible. So much of this information is now received that it would be easy to publish a pamphlet of respectable size at short intervals, and in time its quantity would warrant the establishment of a periodical. He says that the department should be allowed to gratuitously distribute some copies of these, but favors the sale of others, at a low price—say 25 cents each. He believes the public would welcome and sustain such a publication, and earnestly recommends it as a most valuable auxiliary to the department's efforts in behalf of our foreign trade. He also recommends the publication of the large volumes as heretofore, to serve as volumes for reference, and suggests that their character should be explained in the more frequent publications. Paragraphs should be furnished to the newspapers, and circular letters should be promptly sent to Chambers of Commerce and Boards of Trade. But these proposed improvements cannot be

endon, Lord Derby and various select committees have testified to their value and their favorable reception. Chambers of commerce have sent their thanks to the government for the light thrown by these reports upon the question where British industry might be most conveniently carried. In addition to the usual returns required of consuls, each consul of Great Britain must make an annual report upon the trade, commerce and navigation of his district and suggest means of developing trade. The first secretary of each legation must make an annual report upon the finances of the country in which the legation is situated, and is called upon for special reports. Second secretaries are permitted to make reports. All these are published, if of sufficient importance. The secretaries' reports in 1878 were published in four pamphlets; there were 25 of them, and they covered 697 pages. The name of each writer appears with his report. The prices of the pamphlets were from 9d. to 14d. Special reports are sometimes printed separately. For example, those made in 1877 respecting the industrial conflicts in this country, by the Secretary of Legation in this city and the British consuls in other American cities. Among the subjects of the reports made by the legations in this country which were printed in the pamphlets of 1878, were our ship-building trade, the decline of our carrying trade,

The annual reports of the Belgian consuls and their special reports are published in an annual volume of about 800 pages, which is sold for \$1.54. The writers' names are given, and the book is carefully indexed. The receipt of important commercial dispatches is announced in the *Moniteur Belge*, the official journal, and those interested are invited to examine them. The reports of Secretaries of Legation upon a great variety of topics are promptly published in octavo pamphlets and sold at 1 franc each by an agent in Brussels. Thirty-seven of these reports were published from 1871 to 1878 and collected into three volumes. Among the subjects were working men's strikes in England in 1871, criminal justice in England, the Philadelphia Exposition, Prussian Hunting laws, condition of Portuguese colonies, England's penal system, the labor of children in Dutch factories, laws regulating the tenure of property by religious associations in New York State, and the production of sugar, coffee and cotton in Brazil.

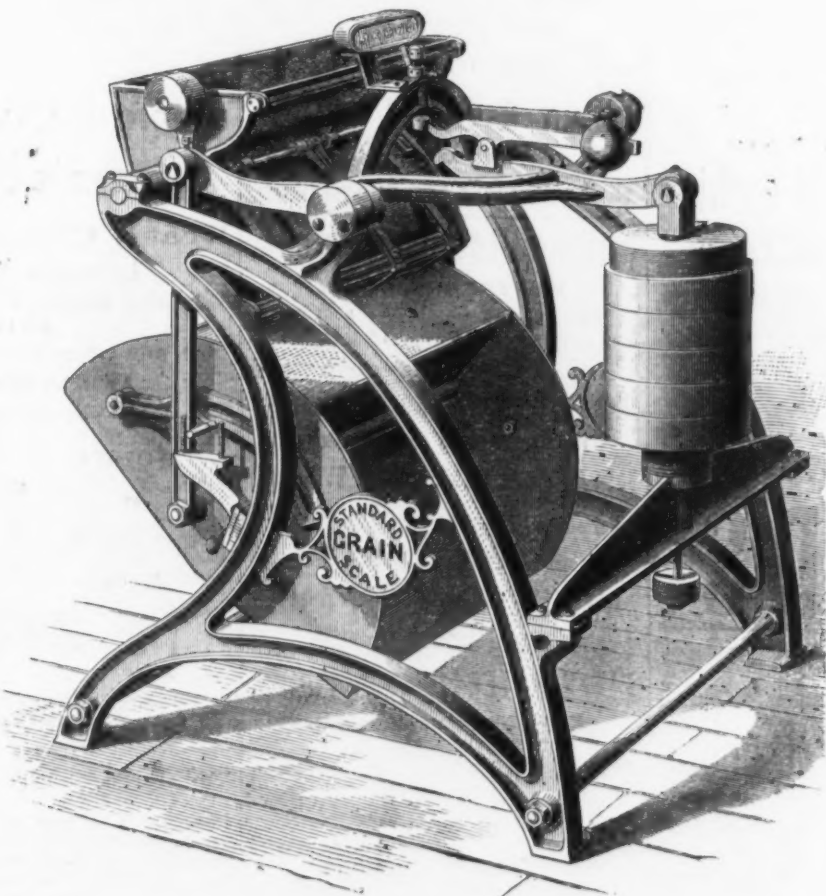
The French "Annals of Foreign Commerce," published since 1843, is the oldest of the regular publications of commercial reports of this kind now existing in Europe. Under this name are published monthly unbound documents under the two general heads, "Commercial Legislation" and "Commercial Facts." These are so printed that they can afterward be bound in volumes, arranged by countries. This publication differs from other foreign consular publications, in that the reports are carefully condensed and edited for it, and are not accompanied by their writers' names. In 1874 a commission for the development of foreign trade was appointed. This commission was engaged in a careful inquiry for about two years. One of its four sub-commissions considered the consular system and the best methods of publishing consuls' reports, and another considered commercial education and the means of encouraging and diffusing it. The commission reported that the "Annals" were valuable as works of reference, but that other means were needed for the prompt and seasonable distribution of news of value to business men. In accordance with the commission's recommendation, the *Consular Bulletin* was established in 1877. This is an octavo pamphlet of 80 pages. In 1878 12 numbers were published containing 125 reports. The name and title of the writer of each report are prominently printed with it. In the *Bulletin* for 1878 there were seven reports from the consul at Liverpool. The annual subscription price is \$3.32, and each number is sold for 1 franc, 25 centimes. Among the subjects reported upon are the petroleum oils of Pennsylvania, the herring fishery off the Scotch coast, commerce and navigation in Chinese ports, trade between the United States and Canada, the Egyptian cotton crop of 1876-7, agriculture in Italy, cultivation of, and trade in, Sicilian wines, and the duty on salt and its production in Russia.

Commercial reports made by the consuls of Sweden and Norway are published in octavo pamphlets. Seven of these pamphlets, containing 91 reports, and covering 342 pages, were published in 1878. Reports of immediate interest and importance are published at once in the *Official Gazette*. The government at one time undertook to publish a weekly commercial review, mainly composed of consular reports, but the subscriptions were not sufficient in number to make it successful. The present publication is sent gratis to Chambers of Commerce, and sold to individuals for \$1.07 per year, or for varying prices for single numbers. All the book stores receive subscriptions.

In the Swiss Confederation, consuls' reports are published as supplements to the *Official Gazette*, which costs 77 cents per year. Local authorities are required to keep this paper on file for examination, and in this way its contents are readily accessible to the public. These reports are also published in an annual volume. The volume for 1877 contained 49 reports, in 618 pages. Very little effort seems to have been made in Austria to disseminate commercial information of this kind, and the German government has established no distinct publication of the commercial reports of consuls. But the Prussian Ministry of Commerce publishes a weekly, called *Archives of Commerce*, in which these reports are inserted, in full or in part. It is said to be difficult for the general public to obtain copies of this paper.

The memorial from the New York Chamber of Commerce was at first referred to the Senate Committee on Printing, but has since been transferred to the Committee on Foreign Relations.

Speculator to old miner in Leadville, handing him a bag of samples: "Gold quartz or carbonates?" The honest miner turned it over in his hand indifferently, took out his knife and picked at it awhile, and then asked, "Got much of it?" "Thousands of tons," answered the other eagerly. "How much do you suppose she'll run?" "Can't tell nuthin' without an assay." "But you can guess, can't you? you can guess?" "Oh, yes, anybody kin guess; but a guess is liable to be extravagant. Now, I should say—but, mind ye, I may go over the mark—I should say a-a-a-y (turning the specimen over again and holding it up to the light), I should say a-a-a-y that if ye can save the gold in this and catch the silver, and not waste the lead, that it might run about—well, about \$2 to the country."



THE "STANDARD" GRAIN SCALE.

of the subjects upon which the consular agents are required to make reports. By an act approved Jan. 29, 1879, they were required to report "such general information as they may be able to obtain, as to how, where and through what channels a market may be opened for American products and manufactures." The secretary annually lays before Congress two volumes, entitled "Foreign Relations" and "Commercial Relations." The first contains diplomatic correspondence, and the second the annual commercial reports of consuls. The latter is the only distinct publication of reports upon commercial subjects from our representatives abroad. It contains a review of the trade of the United States with other countries during the year, and the reports of consuls, alphabetically arranged. The publication of these reports was begun in 1856. But this volume has assumed almost altogether the character of a book of reference, for by long and inevitable delay in publication the value of many of the reports, written upon subjects of great interest at the time of writing, is almost entirely lost to contemporaneous trade. Even if there were no delay in publication, the reports would fail to be useful because of the absence of any well-established system of distributing the volumes. The department was able to print for its own use but 1000 copies in 1876 and 1877, but these were widely distributed. Members of Congress and Senators got their share of the "usual number" ordered to be printed, and most of these, probably, met the fate of so many other volumes of "documents." The secretary says that the volume is "utterly lacking in the essential requisite of being generally and readily accessible." The interesting pamphlet containing answers to the "trade circulars" of 1877 was attached to one of these volumes, and therefore

made with the department's present force and resources, and the secretary recommends the restoration of the former Bureau of Statistics, under the title of "Bureau of Commerce of the Department of State," with a chief of bureau and two clerks. He estimates that for the ensuing fiscal year, an appropriation of \$7000 will pay for printing the pamphlets and circular letters. The remarks which he makes at the conclusion of his reply, concerning the beneficial effect of a good system of publishing reports upon the diplomatic and consular service, bring forward another argument in favor of the proposed improvements. "In the absence of an assured tenure of office, and of an organized career, with the likelihood of gaining promotion," the secretary says, "there is not at present that incentive to energy which it is desirable for a consul to possess. The means of gaining distinction which would be afforded by the publication of their reports, accompanied by their names, and the submission of these reports to the attention of a large and intelligent class of readers, would undoubtedly be welcomed by these officers, and act as a great incentive to their pride and best exertions. The only possible measure of the number of reports from any one consul which could be published would be their importance and interest."

An examination of the methods pursued in several foreign countries shows that we are far behind them in the matter of making such commercial information accessible and attractive to the public. In Great Britain all Parliamentary papers are sold at low prices at regular depots (diplomatic correspondents and many other interesting documents are given a wide circulation. The sale of the commercial reports exceeds that of the other Parliamentary publications, and Lord Clar-

Roach's line of steamers to Brazil, our trade with Brazil and South America, schemes for pushing American trade, views of American consuls on the extension of our foreign trade and British competition. The reports of the consuls were printed in five pamphlets. The reports numbered 175 and covered 1786 pages; the prices were from 19d. to 25d. Consuls' reports upon special subjects are frequently printed separately. All of these reports are very thorough and full of valuable information.

In Italy, the commercial reports of consuls and the non-political reports of diplomatic officers are printed in the *Consular Bulletin*, an octavo pamphlet which appears once a month, and the subscription price is \$2.32 per year. Annual subscriptions are received at book stores in Rome, Florence and Turin. The numbers are also sold separately. The volume for 1877 contained 1233 pages. Among the subjects considered were the London Police, the ice trade at Bombay, the importation of meat from America and its influence upon the cattle trade of Ireland, the grain trade at Odessa, ship-building on the Clyde, primary instruction in England, the woolen fair at Warsaw, and Italian emigration to South America. The *Bulletin* is sent gratis to Chambers of Commerce and similar associations. It is of great value as a collection of statistics and essays, but is not exactly what is desired by merchants. Therefore, when the government receives information of interest to the business community, it gives it to the public in little sheets of four or more pages, called "Bulletins of Commercial Information." From April, 1878, to April, 1879, 17 of these bulletins were published. They are sent in quantities to Chambers of Commerce and similar associations for distribution, and by them news is promptly delivered to those who desire it.

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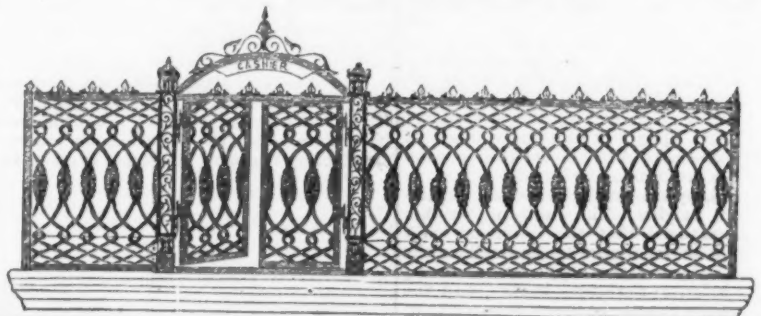
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Private Brands of Tin Plates.

The *Ironmonger*, a journal representing the English hardware and metal trades, in the issue for February 28, contained the following:

A correspondent of our American contemporary, *The Metal Worker*, is somewhat exercised on the subject of "private" brands of tin plates, of which he sends to that journal a list of over 180 names. On looking over these brands we find that few of them, if any, are known in this country, although several bear titles more or less closely resembling the names, &c., of our Welsh works. It will, of course, be understood that these "private" brands are entirely different from the brands proper of the makers. The correspondent in question professes to explain how the difference arises, and why the distinction is made. He says: "You will find them to be either 'Select Wasters' of charcoal or 'First Grade of Coke' plates, and sold in competition with 'Prime Charcoal.' For instance, A quotes 'Melyn,' 'E. C. C.' or 'Talbot' at \$5; B quotes 'L. P. L.' 'P. S. & Co.' or 'Radnor' at \$8.95, and C quotes 'Best Charcoal' at \$8.87. It is natural for the tinman to suppose that C's prices are the lowest, and he orders; but when the plates arrive he probably finds the plates are 'Wales, Roby,' 'Vole,' or 'Albert,' &c. The latter is in reality an 'A. Z.' coke (1st grade), and could probably be bought under its own brand ('A. Z.') from 75 cents to \$1 per box less. This will show how this private brand business is worked, and they will be money in pocket if they will watch the matter more closely." We should be pleased to hear what the manufacturers of tin plates in this country have to say on the subject, which is of undoubted interest to them.

In response to the invitation contained in the latter part of the above, a Welsh manufacturer of tin plates addressed the editor of the *Ironmonger* as follows:

SIR.—The subject of private brands of tin plates referred to in "Editorial Notes," in your issue of the 28th ult., is fraught with more importance to the trade than may easily be imagined, and the sufferers thereby are the manufacturers and consumers, the benefits all going to the owners of the private brands. In addition to the deceptions referred to by your American contemporary, *The Metal Worker*, it may startle your readers to know that many large firms of tin plate merchants buy common coke quality plates, and stipulate that, in addition to private brands being put on the boxes, there shall also be put the words "Best Coke" quality. These plates then pass to the consumer and are paid for as best coke! The maker is indifferent to this, as the brand is not his "B" coke brand. Again, wasters are bought, but often on condition that "W" (the sign for wasters) is not to be put on the box. These plates are subsequently sold as primes to the innocent consumer. Still worse is the fact that common coke waster plates are bought by exporters with a clause in the contract that the quality of the plates is not to appear on the box. When the plates arrive at the place of export the exporter brands them "Charcoal Primes," and the uninitiated consumer abroad pays for them accordingly. Again, a merchant applies to a manufacturer for a quotation for a sample lot of 10 or 20 boxes of plates, "which must be good, with a view to securing further orders." The manufacturer secures the sample order and turns out a good article with a view to further business. A day or so before the plates are sent off, a private brand is ordered to be put on the boxes in lieu of the maker's brand. The samples give entire satisfaction to the consumer, and he orders a large parcel, to meet which the merchant looks out for the cheapest market, regardless of quality, and, as he owns the private brand of the sample, the consumer is not aware of the change from the maker of the excellent samples to the maker of the inferior plates in the second order. When the consumers buy plates of the standard brands of the manufacturers they may rest content on getting a quality consistent with the brand, and which every manufacturer endeavors to keep up to the standard, as the names are seldom changed; whereas, if the consumers buy under private brands they may rely that they are always paying more for the plates than they are worth under their real name.

I think, sir, you would confer a great boon on the manufacturers and consumers if you were to compile a list of the various manufacturers' brands, and until some one does this, and does it reliably, manufacturers and consumers will be losers. I am, sir, yours obediently,

ONE WHO KNOWS THE TRADE.

SOUTH WALES, March 3.

The *Ironmonger*, in commenting on this letter, says:

The letter of "One Who Knows the Trade" is, we venture to state, a document which not merely merits, but demands, the immediate and concentrated attention of every manufacturer and user of tin plates. The writer of the letter informs us that many large firms of merchants buy common coke plates, and stipulate that, in addition to private brands being placed on the boxes, there shall also be marked the words, "Best coke quality," so that the consumer is actually cheated and defrauded by being charged for an article which he does not obtain. We are reluctant to believe the assertion, but we are told that the makers are fully aware of the existence of this practice, and presumably of its object, yet they are indifferent and passive, because the brands so struck are not their "best coke" marks. Further than this, wasters are said to be frequently bought on the condition that the letter "W" (which denotes wasters) shall not be placed on the boxes, so as to allow the plates to be subsequently marked and sold as prime, good articles! Again, our correspondent asserts that common coke wasters are purchased by exporters with a clause in the contract that the quality of the plates is not to be marked on the boxes. When these arrive at the place of exportation the boxes are alleged to be branded as "Charcoal primes," and as such are palmed off upon the unsuspecting consumers. Again, we are informed that sample orders are secured by means of plates of really good quality under private brands, in a manner detailed by our correspondent, whereas the subsequent lots in bulk are composed of plates bought with regard to cheapness only. Against makers' brands, or well-known standard brands, there is not a word to be said, and consumers may invariably rest assured that in buying these they get good value for their money. There is, consequently, no question of the ordinary market brands in this matter. The other part of the subject, however, is of the utmost moment, and we should be shirking our duty if we failed to call attention to it. As we have already stated, we are most reluctant to believe that the practices alluded to by our correspondent are general. We do not for one moment impugn the bona fides of our informant—who is certainly in a position to know whereof he writes—yet we would fain believe that such gross commercial immorality is but partial, and restricted to a few houses. Whether that be the case or not, however, it is plain that the matter cannot be allowed to rest where it is. It must be probed to the very bottom, and the sore exposed to the action of strong and healthy criticism. Every honest and straightforward manufacturer of and dealer in tin plates is vitally concerned in the issues thus raised, and we have, therefore, no hesitation whatever in calling upon the members of the producing and exporting branches of the trade to step

forward and take a manly and courageous part in rooting out the evil. The manufacturers have every possible reason to assist in such an inquiry and investigation. Their reputations, individually and collectively, are at stake, not so much, perhaps, at home as abroad, whence they derive the principal proportion of their business. Will they sit down quietly and meekly under these most serious allegations, or will they arise in the might of conscious innocence and honesty and aid in the exposure and correction of those who, by these tricks, are doing their best to undermine and destroy the reputation of this country for a most important class of manufactures? We await their decision with confidence.

Such a note of warning to the tin plate manufacturers upon the part of our English contemporary cannot altogether fail to receive attention. We very much doubt, however, whether it will carry conviction to the minds of those upon whom the blame rightfully rests. That the tin plate trade with America is in a very unsatisfactory condition is due to a large extent, if not solely, to this matter of private brands, and the gross abuse of public confidence which thereby has been practiced.

Just how far importing houses upon this side of the water are implicated at present it is impossible for us to state, but it would be very difficult to convince our readers that they are entirely blameless. The greed of gain upon the part of dealers, and the demand for cheap goods upon the part of the consumers, have led many to practices of this sort who would have long hesitated before cheating in some other form. That this private brand business in a large number of instances is a swindle, admits of no contradiction. Whoever buys a box of "coke plates" worth say, \$7, and by changing the brand to "best charcoal," or by putting some private brand upon it, leads consumers to believe it is much better than "coke," thereby selling it at \$7.50, \$8 or \$9, is guilty of fraud. He has obtained money by false representations. Transactions of this kind have become so common as to be considered quite respectable. No doubt it will startle some people to hear them characterized in plain terms; but it is time things were called by their right names. Whenever American importers cease buying dishonest goods, English dealers and manufacturers will have no further reason for putting them on the market, and whenever the consumers here are offered honest goods exclusively, they will have no cause to complain of the petty swindles practiced upon them.

American dealers, no doubt, will plead that they are selling just the kind of goods their customers want. Since the complaints made to *The Metal Worker* against private brands (one of which has attracted attention in England) came from the consumers, this part of the question demands special attention. We believe that the dealers, in a plea of this sort, are in a measure correct. We believe the trade, in continually demanding cheaper and cheaper goods, and being willing to be swindled, has put temptation before them. This, however, does not relieve dealers and importers from any of their own proper responsibility. To whatever extent importers have departed from paths of strict rectitude in the matter of private brands, they are to blame, and, on the other hand, to whatever extent the consumers have encouraged them in their dishonest practices, by demanding goods of first-class brands below fair prices, they are to blame. It is certain that if the consumers, even at this date, would refuse to countenance private brands, and would restrict their orders to well-known and thoroughly established makers' brands, the business now based upon private brands would be broken up. Hence it follows that the responsibility primarily rests upon consumers. Many in the trade, no doubt, would be very glad to drop the use of private brands, and many consumers would be glad to use only honest plates in their shops; but many others, who are making a profit by the use of private brands upon the goods they sell or buy, as the case may be, are naturally opposed to any change. Meantime, those who use tinware, and those who own buildings covered with tin roofs, are sighing for the ware and roofs of a long time ago, and are becoming more and more disgusted with work as done at the present time. The innocent sufferer, in consequence of these dishonest brands, is the man who buys ware, or whose building is covered with a tin roof. He has no voice in this discussion, but nevertheless his protest is not to be suppressed. Already he is making his importance felt as a factor in the solution of the problem. He is discarding tin wherever possible and using other materials—not because tin plate is not the proper thing to employ, but because honest tin plate is practically excluded from the market. His influence is likely to be felt by the English manufacturers and to be heeded by them long before the trade at large, and importers particularly, are awake to the situation.

The *Ironmonger* in closing its remarks says: "We have lists both of makers' brands, and 'private' brands, and will publish them, if deemed of sufficient importance to the trade." We think such a publication upon the part of our contemporary would be of great benefit to the trade. We shall take pleasure in republishing it for the benefit of our readers in case it appears.—*The Metal Worker*.

The Secretary of War has ordered an investigation of the Brooklyn Bridge. General John Newton, of the United States Engineer Corps, has received instructions to make a thorough examination and report thereon. It is understood that the main purpose of the inquiry is to satisfy the government that there is a clear height of 135 feet at high-water to the bed of the roadway. This was the distance authorized by the Secretary of War when the work was commenced. An examination has been ordered not only for ascertaining the height referred to, but also as to other minor matters in connection with the construction of the bridge.

Mr. W. H. Scranton, general manager of the Oxford Iron Company, Oxford, N. J., in forms the *Bulletin* that the smaller of his furnaces, which has for some time been running on forge iron, will be changed to spiegelisen next week. It will probably be run as a spiegel furnace through the summer,

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On the Hardening, Tempering and Annealing of Steel.

A committee of the Institution of Mechanical Engineers, consisting of Messrs. William Anderson, Paget, Abel, Brotherhood, Chernoff, Hackney, Ogston, Vavassee, R. Price Williams and A. W. Williamson, have made what appears to be a preliminary report on the wide subject of the hardening, tempering and annealing of steel. This document is a somewhat disconnected summary of the views of prominent writers on the subject. As regards the nature and composition of steel, the committee appear to share the opinion expressed as early as 1852 by Jullien, that steel and cast iron are only mechanical mixtures of carbon and some other substances in pure iron. After a review of the theories held by such men as Barba, Jullien, Caron, Akerman and Gruner, on the quantity of carbon in steel and cast iron and its state, and the evidence adduced by Siemens, Fernie, Chernoff, Bonan and others, in favor of the proposition that high-class steel should contain only iron and carbon, the views of various authorities on the hardening of steel are discussed. Jullien holds that carbon in contact with iron at a cherry-red heat becomes liquid, and is absorbed like water in a sponge, like oxygen in liquid silver, or like gas in porous bodies; cooled slowly, the carbon becomes amorphous, and the steel becomes soft as iron; cooled quickly, the carbon crystallizes to depths proportioned to the energy of cooling, and steel becomes diamond set in iron. This theory, even if it accounts for the hardening of steel, does not account for tempering. What takes place when hardened steel is heated, and passes through all the gradations of hardness indicated by their characteristic colors? Jullien quotes Borzel as stating that when a saline solution, saturated, or not, is allowed to cool quickly almost to the congealing point, the periphery which is first cooled becomes less saline than the center; until at last, when the entire mass has solidified, the dissolved salt is found concentrated in the center. From this fact he infers that two bodies dissolving each other, and preserving their independence in solution, must produce solid compounds of varying properties according to the rate at which cooling takes place. Furthermore, all solid bodies are susceptible of two different molecular structures, dependent on the rate of cooling from the fluid state; but this rate of cooling does not produce the same results on all. Thus, gold, silver and copper, if cast in chills, yield a fibrous structure, while, if cast in sand molds, they exhibit a crystalline structure; and the fibrous structure can be changed into the crystalline by a temperature short of fusion. Carbon and glass behave quite otherwise. Diamond, exposed sufficiently long to a high temperature in a covered crucible, becomes amorphous or graphite; hence, it may be concluded that, if it could be taken liquid and subjected to energetic cooling, it would crystallize, while under slow cooling it would become graphite. Glass, taken liquid and submitted to energetic cooling, crystallizes; but when annealed, it becomes amorphous or ceramized. He, therefore, considers that a mixture of iron and carbon, if cooled quickly, becomes hard because the carbon crystallizes into diamond; while, if it is cooled slowly, the carbon remains amorphous and comparatively soft. Chilled gray cast iron has a mottled band between the chilled and unchilled parts; this is the zone where the carbon is partly crystalline and partly amorphous.

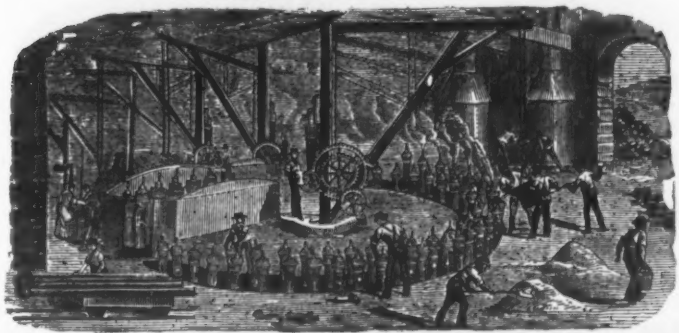
Gruner considers that carbon is dissolved in hot iron; that when cooled slowly the carbon has time to separate as graphite, but when cooled quickly there is no time for separation; and white chilled iron instead of gray cast iron is the result. Soft and hard steel show a similar difference, though to a less degree. Barba and Akerman consider that the compression resulting from rapid cooling is the cause of a greater amount of carbon being retained in solution, and prevented from separating as graphite. The committee find it difficult to accept this theory, because the compression of the internal portion of a piece of steel is caused by the contraction of the outer layers; and these, therefore, must be stretched, as indeed it is well known that they are. But in hardened steel the outer layers, which were most energetically cooled, are the hardest, although they must have been, and probably are, in a state of tension. Akerman, however, considers that compression, or forcing together of the particles, the amount of which is dependent on the rapidity of cooling, produces hardening; and that the intensity of this hardening depends on the compactness of the material and its limits of elasticity. By way of proof, he states that cold working, rolling, and wire drawing produce similar results.

As far as the molecular changes that occur in hardening, tempering and annealing are concerned, the committee state that the theory announced by Chernoff in 1863 to the Imperial Russian Technical Society appears to explain in a satisfactory manner the molecular changes that take place in steel when subjected to changes of temperature. His view is that: 1. There is a certain temperature a , such that steel, of whatever quality, will not harden if heated to any temperature below a and energetically cooled. 2. There is some higher temperature b , above which steel changes from the crystalline to the amorphous condition. 3. If heated to a temperature between a and b , steel may harden, but does not change its structure, whether cooled quickly or slowly. 4. If heated above the temperature b , and up to the melting-point, steel has a wax-like structure, is incompressible, and tends to crystallize into large crystals if left to cool undisturbed, but into smaller crystals if hammered or if rapidly cooled.

Fine grain is essential to good tough steel; hence, by heating up to the temperature b , so as to produce the amorphous condition, and then cooling suddenly to below a in oil or water, good steel can be obtained. The temperatures a and b vary with the nature of the steel. Chernoff illustrates his views by reference to the behavior of alum undergoing crystallization; and the close reasoning of his remarkable paper carries a strong conviction of the correctness of the views he

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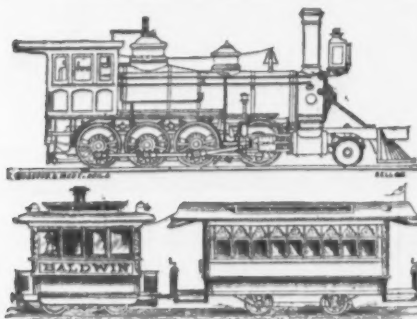
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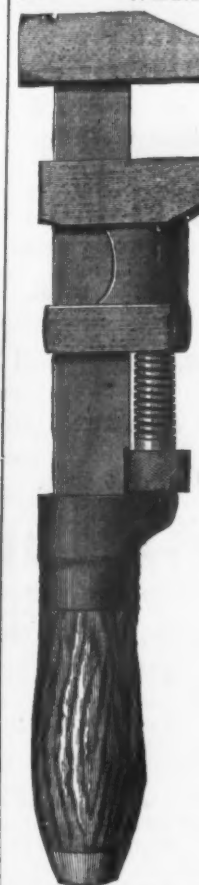
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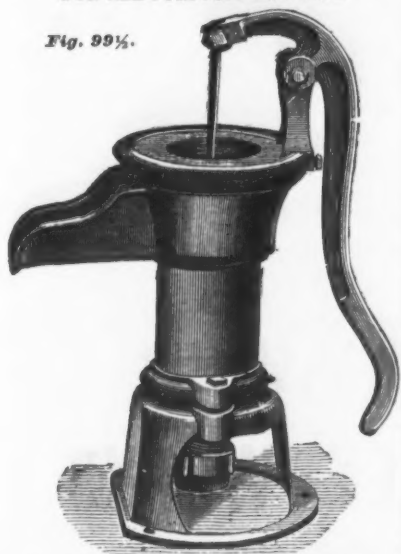
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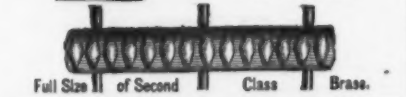
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Fig. 145.



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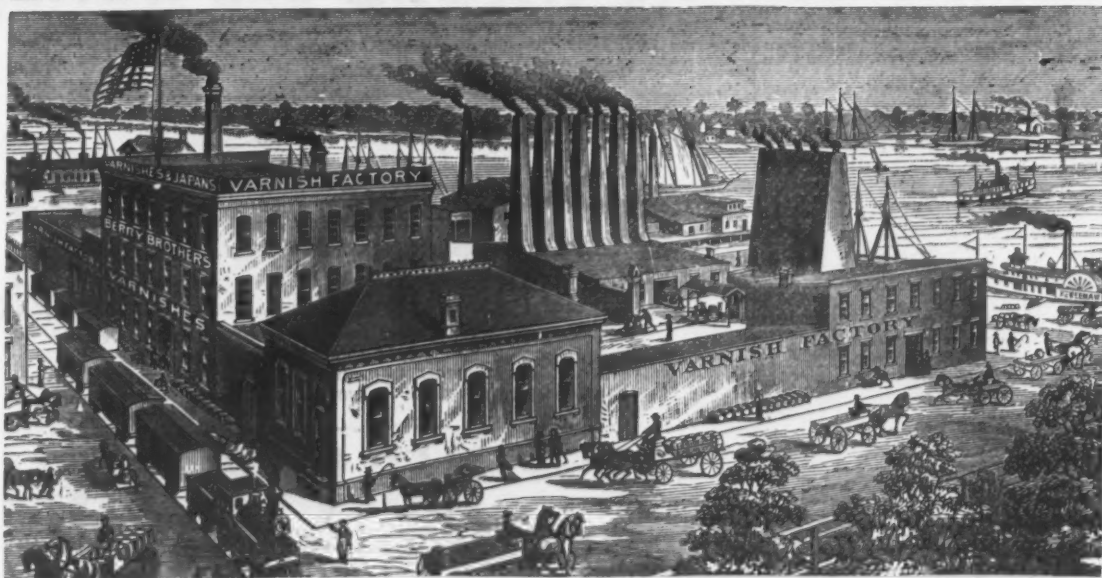


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advocates. There are abundant illustrations of his theory to be found in the many writers on steel who have been consulted.

Prof. Gore, in 1869, and subsequently Prof. Barrett, in 1873, drew attention to certain anomalies that occurred in the expansion and contraction of iron wire; and in 1877 Prof. Norris published the results of his experiments on the same subject, which appear to confirm Chernoff's theory in a remarkable manner. In cooling a strained iron wire from redness, it was found that the contraction due to cooling was, at a certain point and for a limited period, changed into an action of elongation. In good iron wire this irregularity could not be detected, but in hard wire and steel it was very apparent. The wire has to be raised to a very high temperature before the temporary elongation during cooling can be seen; and it does not take place if the wire is heated only just beyond the temperature at which it occurs. Prof. Norris' researches have led him to the following conclusions: 1. That in steel, and in iron containing free carbon, there is a contraction or shortening which is excited by heat, and which proceeds simultaneously with the dynamical expansion, and masks its true amount. This is divisible into high and low-temperature contraction. 2. That similarly there is a cooling expansion or crystallization, which comes in during the dynamical contraction and masks its true amount. 3. That these effects, due to crystallization and decrystallization, are the causes of the so-called 'kicks' or temporary contractions and expansions which occur during the heating and cooling respectively of the steel. 4. That the low-temperature contraction and cooling expansion are due to decrystallization, which occurs during the acts of heating and cooling; while the 'kicks' themselves are simply the thermal effects associated with these changes, and are proportionate to their extent. 5. That protracted annealing, i. e., extremely slow cooling, brings about molecular separation of the carbon and iron. Steel in such a state contracts greatly when high temperatures are reached, producing the effects of contraction which are seen at the end of the heating, and which are due to the condensation produced by the recombination of the carbon and iron. Steel in this state is less susceptible to cooling expansion (or crystallization), and therefore to low-temperature contraction on subsequent heating.

It would seem that the "kicks" observed by Prof. Norris probably occur somewhere in the region of Chernoff's temperatures a and b, where a change in the molecular structure of steel appears to take place, according to his theory. At any rate it is plain that molecular changes of some kind do occur, and manifest themselves by altering the bulk of the metal.

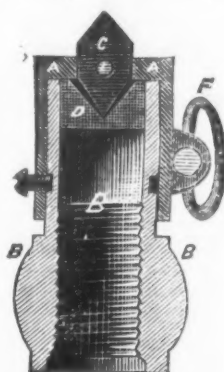
After citing the experiments made by Edison with platinum iron exposed to high temperature in a vacuum, the committee closes its report as follows:

It appears that the expulsion of the gases contained in the body of the metals may have the effect of bringing the ultimate atoms closer together, increasing thereby the force of their cohesion, and consequently resisting more strongly any rearrangement that would be necessary in annealing. It would appear also that the existence of gases in the pores of metals is an attribute of their normal states; and that the expulsion of the gases increases hardness, and necessarily raises the melting-point, on account of the stronger cohesion of the atoms. May it not be that the sudden contraction in hardening steel has the effect of expelling occluded gases; that subsequent tempering by raising the temperature has the effect of permitting a fresh absorption; and that the iridescent colors which accompany tempering are due to change of surface caused by the infiltration of gases? Another view is that the mere heating of steel to the proper temperature for hardening is sufficient to

shaped fragment of the frontal bone, measuring three inches in length and seven-eighths of an inch in width in the center or wider part, thus producing not only a compound fracture of the skull, but cutting through the longitudinal sinus, or large blood vessel of the interior of the top of the head, permitting an extrusion and loss of a considerable portion of the brain substance. The wound was pronounced fatal, but days grew into weeks and weeks into months, and the man still lived. At length the wound was closed by soft tissue, and later about one half the cavity was closed by a new bony formation, and the remaining part is now covered by soft tissue, through which the pulsations of the brain are plainly visible. It is said that there is but one other such case on record. Davis possesses all his mental faculties.

Lathrop's Self-Feeding Ratchet Drill.

S. P. Lathrop, of Newark, N. J., is the inventor and manufacturer of a self-feeding ratchet drill, which is claimed to be equally adapted to light and heavy work, being capable of instant adjustment to any required cut. The tool is simple in construction, and its operation will be readily understood from an inspection of the figures. The



LATHROP'S SELF-FEEDING RATCHET DRILL.—
Fig. 1.

inner or feed-sleeve B, Figs. 1 and 3, screws upon the drill spindle, and is provided with a friction or outer sleeve, A, in the head of which is secured a steel chisel-shaped pin, C. The lower end of C is pointed and rests upon a hardened steel bearing, D, fixed in the head of the inner sleeve B. This sleeve, with its bearing D, revolves upon the point of the pin C, and within the friction-sleeve A. The head of the pin C being chisel-shaped prevents the pin and the outer sleeve A from revolving. If the friction screw F is unscrewed, B is free to rotate



LATHROP'S SELF-FEEDING RATCHET DRILL.—
Fig. 2.

upon the bearing of the pin C; but by tightening F the friction on the inner sleeve B may be increased, causing the sleeve to remain stationary, and consequently, causing the screw on the drill spindle to feed the drill until the friction on the drill becomes greater than that on the sleeve B. When this occurs B again rotates within the outer sleeve, and continues to do so until the drill has finished cutting the chip, when the operation is again repeated. The feed may, of course, be readily adjusted by tightening or loosening the friction screw F.

Steel Making in China.

In the manufacture and use of steel, as in other symbols and aspects of civilization, the Chinese appear to have attained a very early and remarkable proficiency. Mr. Jeans, in his recent work on steel, says that unfortunately Chinese records do not enlighten



LATHROP'S SELF-FEEDING RATCHET DRILL.—Fig. 3.

expel a portion of the gases, which are kept out by sudden cooling, and are slowly re-absorbed in tempering. Graham states that platinum at a low red heat will absorb four times its volume of hydrogen, and that palladium condenses more than 600 times its volume of hydrogen at a temperature below that of boiling water. May not steel therefore possess analogous properties with respect to some of the gases constituting the air? May it not absorb these more freely as the temperature of tempering rises, and so gradually becomes restored to its original softness.

The directions in which further investigation appears to be needed, is pointed out as follows: 1. To investigate whether Edison's theory can be applied to the explanation of the hardening and tempering of steel; and to ascertain by experiment whether absorption and expulsion of gases take place. 2. To determine by analysis whether any chemical difference exists between the outer and inner layers of a piece of hardened steel, which before hardening was of homogeneous structure. 3. To ascertain whether there is any connection between Chernoff's theory and Norris's observations on the contraction and expansion of wires.

F. M. Davis is a heater at the rolling mill of the Philadelphia Iron and Steel Company. In June, 1878, he met with an accident. An iron clamp was thrown from a revolving flywheel, and one of the sharp angles struck him in the forehead, breaking loose and partly forcing through the skin a crescent-

us as to the precise period at which the art of reducing metals from their ores became known in that country, but it is evident that it must have been some centuries before the Christian era. It is not, indeed, unreasonable to conclude that this knowledge was at any rate concurrent with, if not antecedent to, the discovery of the attractive power of the loadstone, which seems to have been used by the Chinese in the reign of the Emperor Hoangti, about 2600 B. C. Mention is made of steel in the most ancient of the Chinese writings, and Leih-tze, an author who flourished about 400 B. C., describes the process by which it was made. In the Yu Kung section of the Shoo King, Book I., it is stated, that among the articles forming the tribute of Yu., were nautical gem stones, iron, silver, steel, stones for arrow heads, &c. Legge points out the difference of soft iron, and hard iron or steel, as distinguished by the Chinese, and remarks that in the time of the Han dynasty, ironmasters were appointed in several districts of the old Leangchou to superintend the iron works. With the exception of this passage, however, it is considered probable that there is no distinct allusion to iron in Chinese writings older than 1000 B. C. In describing the manufacture of steel in China, the Pi-tan or Pencil-Talk, states that wrought iron is bent or twisted up, and unwrought iron is thrown into it. It is then covered up with mud and subjected to the action of fire, and afterward to the hammer. On this passage, Day remarks that it comes remarkably near describing the process of immersing wrought iron either into molten cast

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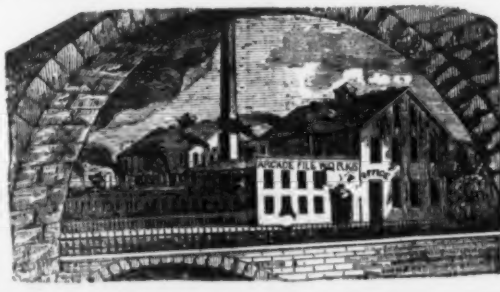
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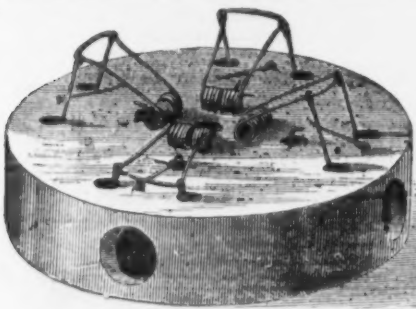
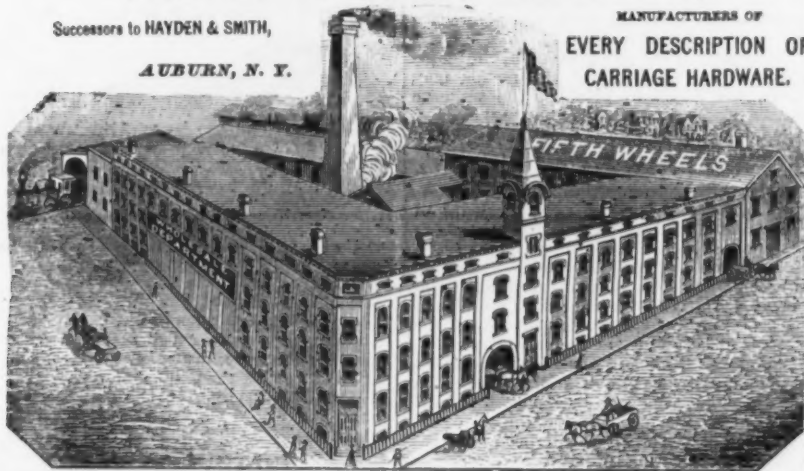
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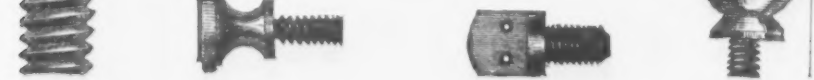
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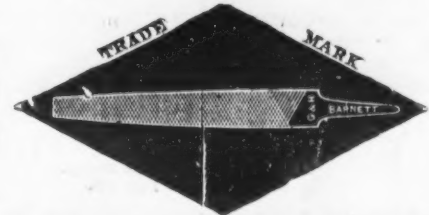
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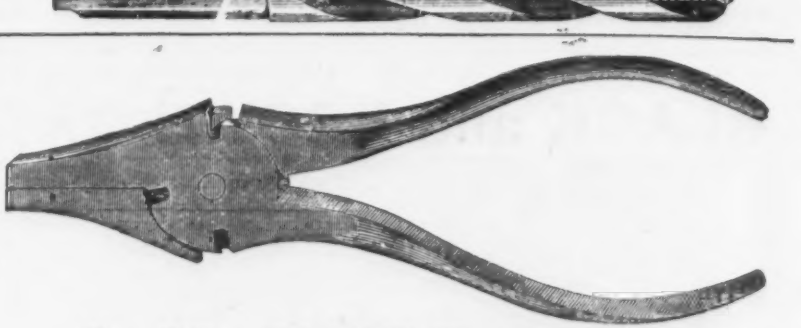
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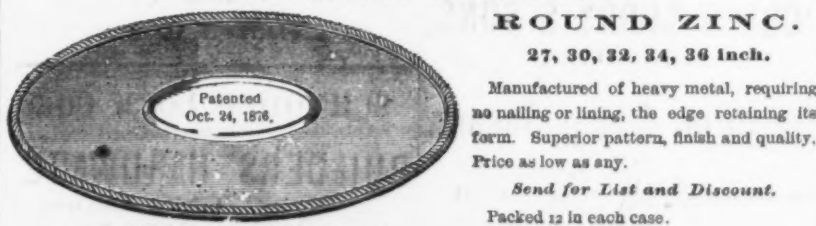
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STOVE RESTS are designed to place under the feet of Stoves and Ranges, for the purpose of raising them from the floor or platform. They are about 1/2-inch thick, covered with sheet metal in zinc, brass and nickel plate. Highly polished and finished. Packed one set of 4 pieces in each paper box, and 36 sets in each case. Sizes (inside of circle on top):
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"PINNACLE" SASH LOCK. BURGLAR PROOF.

In locking, the arm is brought forward, and the spring bolt engages with the post in the back plate. In unlocking, the knob is pulled out, and the arm throws back, where it is held. Only one spring is used in the lock.
PAYSON MFG. CO.,
CHICAGO.

RICHARD DUDGEON,
No. 24 Columbia Street, New York,
Maker and Patentee of the Improved
Hydraulic Jacks
AND
Punches.
Roller Tube Expanders and Direct Acting Steam Hammers.
Communications by letter will receive prompt attention.
Jacks for pressing on Car Wheels or Crank Pins made to order.

EVERY
PUTNAM NAIL
is drawn down to a point from the rod, thus:
It is the only Hot Forged and Hammer Pointed Horse Shoe Nail, made by machinery, in the World.
Some other manufacturers claim to make a hot forged Nail, but you will observe on all such a sheared edge near the point.
THE PUTNAM NAIL CO., Boston.
P. O. Address, Neponset, Mass., U. S. A.

iron, or heating it with iron ore and fuel covered over with layers of mud or clay, to exclude, as much as possible, the oxidizing influence of the external atmosphere. At a subsequent period the Chinese records describe the different kinds of steel produced. That obtained by the first process they call ball steel, *Tuan Kang* (from its rounded form), or sprinkled steel, *Kuan Kang* (from the pouring of water). Another kind is spoken of as "false steel," "wei tee," and it is quaintly added that "iron has steel within it, as meal contains vermicelli." In the "Peut Saow" (a work of the Ming dynasty), again, three kinds of steel are described, thus: "1. That which is produced by the adding of unwrought to wrought iron while the mass is subject to the action of fire. 2. Pure iron many times subjected to fire produces steel. 3. Native steel, produced in the southwest, at Hai Shan, and which is like in appearance to the stone called *Tsze-shit-ying*—purple stone efflorescence." Steel continues to be manufactured in China to the present day. James Henderson, a commissioner of Li-hung-chang, the Governor-General of Chihli, and minister of the young King of China, states that "the steel which comes to Tien-tzin from the upper Yangtze is highly prized, and bears much higher prices than the Swedish steel imported into China."

The Present Position of the Model Question.

BY THOMAS D. STETSON.

Americans are proud of their Patent Office collection of models of inventions, but the luxury has become oppressive. The hollow square building had four upper halls, two of which were burned in the fire of September 24, 1877. About 112,000 models were destroyed or damaged, but some 18,000 have since been restored by cleaning and repairing, and the two unburned halls now in use contain, at this hour, about 114,000 models, ranging from miniature derricks and canal locks of say 1 1/2 cubic feet, down to full-size or enlarged watch motions, buttons, hair pins and metallic pens of almost no magnitude. Each has one or more tags, giving name, purpose and date of filing, and the date and number of the patent. They are classified, and are arranged museum-wise, in glass cases, on the ground floor and in galleries. The total area of the shelving covers 74,000 square feet, or about two acres. General Faine, the retiring Commissioner, in his official report to Congress at the beginning of this year, presents a calculation that, if our country should continue accumulating models with the modern ratio of increase, 50 such halls as the present two will be required to store the models before the next Centennial. Does it pay? Opinions differ. The writer belongs to the anti-model party. He believes the world will be richer in the possession of broadly distributed, cheap printed copies of well-prepared patents, than in an impracticably large collection of toys purporting to illustrate them. Models impose, in most cases, a considerable tax on the inventor to produce them. Only the dreamiest kind of inventions are made in the act of producing the models. They are in no proper sense a reduction to practice—not so much as working drawings would be. They are always an expense to the government to preserve and exhibit them. They are frequently an embarrassment to the solicitor to shape his claims in conformity therewith. But this article is to enlighten as to the facts rather than to argue any particular view. While the department is unprepared to authoritatively define the exact status detail, an unofficial canvass will be appreciated.

Other countries allow the presenting of models to accompany applications for patents, considering them, as does the United States, of, but not in, the patent. England has a large collection, but does not require a model as a necessary prerequisite to the granting of a patent. Canada has adopted a middle course; it receives and grants an application without a model, but requires a model before the actual delivery of the patent. It follows that, as the possession of the patent is not required until an infringement suit arises, Canada is granting a great number of exclusive privileges which secure the right, and the fact is announced in the official list of patents, while the actual issue of the sealed certificate is withheld and will probably never issue in but a few per cent. of the cases. There appears no objection to this, which seems at first an absurd proceeding. In Russia the law requires a model when the case admits of one, but, as in Germany and several other countries where such provisions exist, the requirement for a model is usually dispensed with.

The United States act of 1793, sec. 3, provided: "And such inventor shall, moreover, deliver a model of his machine, provided the Secretary shall deem such a model to be necessary." In 1836, section 6, this was changed to "shall, moreover, provide a model of his invention in all cases which admit of a representation by model," no discretion by the Secretary of State or any one else being allowed. In 1870, section 29, this was changed to the same as the present Revised Statutes, section 4891: "The applicant, if required by the Commissioner, shall * * *". The practice for a short time immediately after the passage of the act of July 8, 1870, was to dispense with models in a great proportion of cases. Soon it was left to the individual judgment or wishes of the several examiners, and in 1874 the then commissioner, General Leggett, who was peculiarly an advocate of models, in his official annual report to Congress wrote: "Experience has clearly demonstrated that models should be demanded in all cases," and they were. Thus the practice was restored to the same inflexible character it possessed under the act of 1836.

A new edition of Rules and Regulations, issued December 1, 1879, retained all the old requirements for models: "The model must clearly exhibit every feature of the machine which forms the subject of a claim of invention." But the question had been much discussed, and on March 2, 1880, the *Official Gazette* announced, dated February 24, 1880,

and to take effect March 1, 1880, the first clause of Rule 31 amended as follows:

"31. No application for a patent will be placed upon the files for examination until all its parts, except the model or specimen, are received."

Rule 55 was amended as follows:

"55. Preliminary examinations will not be made for the purpose of determining whether models are required in particular cases. Applications complete in all other respects will be sent to the examining divisions, whether models are or are not furnished. A model will not be required or admitted as a part of the application until, on examination of the case in its regular order, the primary examiner shall find it to be necessary or useful, and shall file a written certificate to that effect, which will constitute an official action in the case. Models not required nor admitted, if already filed, will be returned to the applicants. When a model shall be required the examination will be suspended until it shall be filed. From a decision of the primary examiner overruling a motion to dispense with a model an appeal may be taken to the commissioner in person, under the provisions of Rule 140."

This remanded the matter again to the discretion of the several examiners. It is natural that decisions of the several examiners should vary, partly by the nature of the classes of subjects, partly by a difference in facility of studying drawings and models, and partly by a desire to continue or to reverse, as the case may be, the former practice. After some six weeks under the new regime, the proportion of cases in which models are required in the several classes are approximately as follows. The figures give the percentage of cases, not in which a model will be accepted if voluntarily furnished, for that is yet undetermined, but the percentage in which it is to-day considered impracticable or inexpedient to proceed without one, and in which a model is imperatively required:

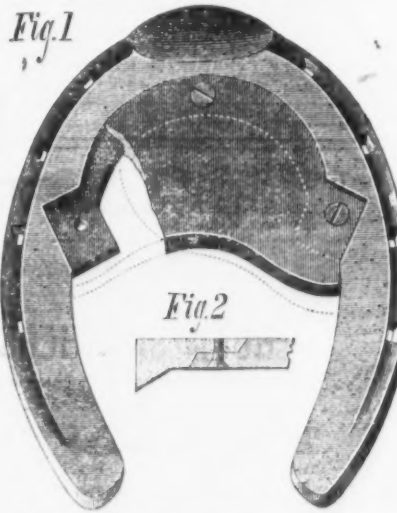
Chief Examiner.	General Class.	Model Demanded.
Pierce.—Dairy, butchering, &c.		Practically no model required.
Pond.—Railways, roofing.		
Cooke.—Furniture, washing.		
Schoepf.—Presses, elevators.		
Jayne.—Forging, turning.		
Catlin.—Stoves, lamps.		
Bowen.—Pumps, water wheels.		
Bartlett.—Wood working.		
Sanders.—Carriages, cars.		
Townsend.—Electricity, weighing.		
Hedrick.—Pottery, glass, paper.		
Burke.—Fine arts, clothing, music.		
Stocking.—Sheet metal, founding.		
Fox.—Plows, planters.		
Dyrenforth.—Gas, sugar, salt.		
Antisell.—Dyeing, brewing, preserving.		
Chapman.—Tanning and leather working.		
Fowler.—Steam engines and boilers.		
Freeman.—Printing presses.		
Wilkinson.—Hardware.		
Boyd.—Harvesting, thrashing, grinding.		
Appleton.—Carding, spinning, weaving, sewing.		

These ratios, good for this first half of April, 1880, are liable to vary greatly with time. But there are no immediate indications of a change. The present acting commissioner, Mr. Doolittle, in deciding an appeal in the case Jové, (March 16, 1880), says: "The policy of the office now is to require drawings to be made so full and clear that in all simple, easily understood cases, models may be dispensed with," and he dispensed with a model in the case—a steam whistle—where the examiner had elected to require one.

New York, April 12, 1880.

Seixas' Weighted Horseshoe.

Mr. Eugene E. Seixas, of Galveston, Texas, has invented an improved weighted horseshoe, which we illustrate on this page. It is designed for use in training horses to trot rapidly, by causing them to extend their strides, and may also be used for preventing the horse from striking his knees with his



SEIXAS' WEIGHTED HORSE SHOE

feet. As shown in Fig. 1, the weight is fitted to a rabbit formed in the shoe, and is secured by three screws, so that it may be readily removed. Fig. 2 represents a section of the shoe and weight through the joint, and a portion of the weight in Fig. 1 is broken off in order to show the form of the shoe under the joint. When the shoe is used to prevent the horse from striking his knees with his feet, the weight is arranged as shown in the dotted lines in Fig. 1, in order to bear more on one side of the foot than the other.

For the moment, the rail mill of the Pennsylvania Steel Co. seems to be ahead in the race for the distinction of turning out the largest number of rails in a given time. On the 8th inst. the mill produced in "less" than 12 hours 936 finished steel rails, the average time to roll one rail being 46 seconds.

The railway system of France was extended, during the year 1879, by 618 kilometers, or 383 miles. This, of course, will be very considerably exceeded during the present year, in which M. de Freycinet's plans will commence to be realized.

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FRIEDMANN & LAUTERJUNG,

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Sole proprietors of the renowned full concave
"ELECTRIC RAZORS,"
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CONGRESS
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ACCORDANCE WITH THE GERMAN TRADE
MARKS REGISTRATION ACT.

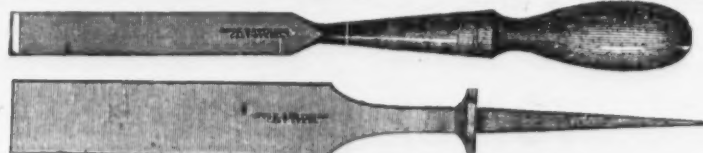
BUTCHERS' KNIVES,
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It having come to the knowledge of
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Axes and Hatchets,
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Mill Picks,
Box Chisels and Scrapers,

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BALL'S PAT. SOLID STEEL SHEEP SHEARS.
These shears are unsurpassed for cheapness, dura-
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of steel from point to point, and cannot be broken in
use either in the bow or at the junction of the shank
and blade. Samples can be seen at above address, or
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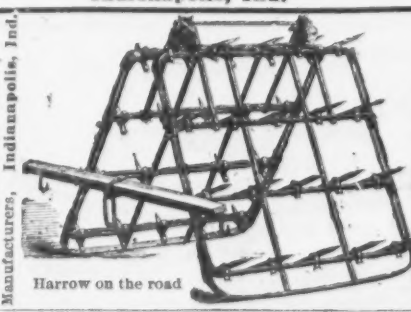
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A large stock of

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Iron and Brass Wood Screws.

We manufacture a full line of
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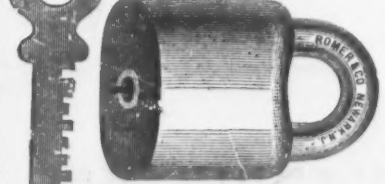
Quality, finish and tests as to strength, guaranteed equal to any in the market. With improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts.

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INDUSTRIAL ITEMS.

MAINE.

Kittery has voted to exempt from taxation for ten years any new factory that may be started there employing twenty men.

N. Dustin & Co., of Dexter, are to build a new machine and blacksmith shop and foundry, thus doubling their capacity.

NEW HAMPSHIRE.

The old hosiery mill, at Meredith Village, has been leased by the American Twist Drill Co., of Woonsocket, R. I., for a term of ten years. They intend manufacturing solid emery wheels, automatic knife grinders, emery wheel machinery and mechanics' tools. They will start up about the first of next month.

MASSACHUSETTS.

A new company for the manufacture of whips has been formed at Westfield, with a capital of \$50,000. The firm is E. L. Sanford & Co., and comprises E. L. Sanford, F. A. Sanford, Charles J. Bradley and L. L. Sperry, all of whom have been, until within a short time, connected with W. H. Owen & Co. The factory will be in the building formerly used by Steer & Turner as an organ shop, and C. J. Bradley will have the general management of the manufacturing. The firm will begin operations in about three weeks with 25 hands.

The Pocasset Iron Works are now in full blast, employing over 50 men, and turning out 8 or 9 tons of ware per day.

The foundry at North Andover is to be enlarged. The addition will be one story high.

CONNECTICUT.

L. B. Taylor, of American Shear Co., Hotchkissville, and American Knife Co., Thomaston, has just returned from Europe, bringing with him 80 skilled workmen to be employed by the corporations above named. This additional force of workmen, it is expected, will enable them to fill orders with more promptness than they have been able to do of late.

The interior of the large and fine office of the Benedict & Burnham Manufacturing Company, at Waterbury, was burned out on the night of the 7th inst. A portion of the building was occupied for the manufacture of the Waterbury watch. The machinery was considerably damaged by water, and thousands of watches in the works were ruined. Loss on building and contents, \$75,000; insurance, \$45,000.

The Barnes Bros. Clock Company has been organized at Bristol, as a successor to the Atkins Company, with a capital stock of \$15,000.

The Kennedy Bolt Shops and the Cottrell Foundry were burned at Plainville last week.

NEW YORK.

The Albany and Rensselaer Iron and Steel Company propose putting in, this summer, a continuous wire train of rolls on the Belgian principle. It will be made by A. Garrison & Co., of Pittsburgh, Pa.

PENNSYLVANIA.

The Erie City Iron Works expect to turn out 1200 boilers this year. The firm also have the contract for building the iron tube for the tunnel under the North River. It will be 21 feet in diameter, and will require about 4500 tons boiler iron.

The Beatty Axe Works of H. B. Black, Chester, were destroyed by fire on the night of the 6th inst. The buildings and stock are fully insured.

The repairs on the larger of the Danville Furnaces are nearly completed, and the furnace is expected to blow in to-day, the 15th.

It is rumored that a rolling mill will be built along the Colebrookdale Railroad, in the eastern part of the State, between Boyertown and the terminus of the road.

The Philadelphia and Reading Coal and Iron Co. are making extensive improvements at the Swede Furnace, at Swedeland. The stack of Furnace No. 2 has been completely torn down, and is to be entirely reconstructed. At No. 1 Furnace the old stack will be retained, but a casing will be put on top, increasing the height to 73 feet, and making it the highest furnace in the Schuylkill Valley. Furnace No. 1, it is expected, will be ready to go in blast in July, while No. 2 is not expected to be in operation before next winter. The old engine of Furnace No. 1 has been sold for scrap iron, and the engine of No. 2 will be transferred to No. 1 and used to keep it in blast next summer.

The Warwick Furnace at Pottstown made 269½ tons of iron in the seven days ending the 3d inst.

The third of the new Monitor Furnaces, at Birdsboro is nearing completion.

The Stony Creek Rolling Mill, at Norristown, after an idleness of several weeks, resumed operations on the 5th inst.

The Harrisburg Car Manufacturing Company's planing mill was burned on Saturday the 10th. Loss, \$40,000; insurance, \$15,000.

McKee & Fuller, at Catasauqua, are building an extension of their car-wheel works, and will put up two steam hammers to make car axles.

The Durham Furnace, at Riegelsville, has gone out of blast. The difficulty was caused some time since by the breaking of one of the engines, which required two weeks to repair. During this time the furnace was run with one engine, and not being driven to her capacity, a scaffold was formed, from the effects of which she has never recovered, although at times since then she has worked exceedingly well, making as high as 450 tons per week. Prior to this mishap she was making upward of 500 tons weekly, and on a single day she made 83 gross tons. We understand that she will be started again as soon as the proper repairs are made.

A fire occurred, last Saturday, in the wire mill of the Gautier Steel Company, Limited, at Johnstown. No serious damage was done, however, and the company declare that there will not be the slightest interruption in the manufacture or shipment of their goods.

PITTSBURGH AND VICINITY.

The Co-operative Foundry Association, of Beaver Falls, reports that the demand for "Farole" cook stoves is assuming large proportions. This stove was patented this year.

Mr. E. A. Macrum has withdrawn from the firms of Everson, Macrum & Co. and the Scottsdale Furnace Company. The remaining partners will carry on the business under the old name.

The Lemont Furnace, near Uniontown, Fayette County, which stopped on the 17th of February, restarted on the 27th ult. It has been relined.

The new lampblack factory at Murraysville has not commenced operations. The flow of natural gas from the well is as strong as ever. The proprietors estimate that the gas escapes with a pressure of 200 pounds to the square inch.

For some weeks past the citizens of Alliance, Ohio, have been making efforts to secure the removal of the P. F. W. & C. R. E. shops from Allegheny to their town, but inquiry developed the fact that the shops will remain where they are. The work cost \$1,000,000, and the expenses that would be incurred by their removal would therefore be great. The capacity of the shops is one locomotive a day.

The window glass factory of Messrs. Thos. Wrightman & Co. was destroyed by fire on the morning of the 10th. The pots were destroyed, the furnaces probably ruined and a large amount of soda ash badly damaged. The loss, however, is fully covered by insurance.

On Saturday evening, the 10th inst., flames were discovered in the works of Messrs. William B. Scaife & Co., sheet iron workers. The damage to building and machinery will not reach over \$2000, and the loss is covered by insurance.

VIRGINIA.

Speaking of the recent fire at the Buffalo Gap Iron Co.'s works, the Valley Virginia says: The company, we understand, propose to erect more extensive works of iron and brick and to again commence operations in about six weeks.

WEST VIRGINIA.

It is stated that the Moundsville Rolling Mill will probably be offered for sale before long. There is a mortgage of \$17,000 on it, held in \$1000 bonds, bearing 9 per cent. interest, beside some other debts. The mill cost over \$50,000, it is said, but has never made any money for the stockholders.

OHIO.

It is reported that the indications are most favorable for securing the manufacture of the Ludlow lock in Youngstown. Mr. Ludlow has been made an offer of buildings and grounds which, we understand, is very favorably regarded by him, and a committee of citizens have been appointed to negotiate with him and conclude the matter as soon as possible.

The Mahoning Valley Iron Co. are considering as to the advisability of introducing the electric light into their mill.

We are informed by Mr. Bramwell, general manager of the New York and Ohio Iron and Steel Co., that they expect to have their mill and furnace ready for work by the 1st of next month.

The Cuyahoga Works, of Cleveland, have just finished another of their largest size steam helve hammers for the Otis Steel and Iron Co. This hammer is the third one built by them for the Otis Company, and has a steam cylinder 32 inches bore, the hammer head weighing over 4000 pounds.

The furnaces of the Glasgow and Port Washington Iron and Coal Company, Limited, are both 70 feet stacks, with 17½ feet boshes and 6 tuyeres. These furnaces were built about six years ago, and were in blast about two years. They formerly used all Connellsville coke, but are now building coke ovens, and will manufacture coke from coal taken from their own lands.

The large new manufacturing of James Leffel & Co., at Springfield, is now being illuminated by the Weston Electric Light.

The steel department of the Burgess Steel and Iron Works, at Portsmouth, was destroyed by fire on Monday, the 5th inst. The building was totally burned. Loss, \$8000; insured for \$6500. It will be immediately rebuilt.

The shops of the Cleveland and Pittsburgh Railroad, at Marietta, were burned on the night of the 7th, together with three locomotives. Loss, \$7000; no insurance.

A leading safe manufacturing company of Cincinnati claims to have made last week the largest contract of the kind ever made, comprising 2,000,000 pounds of plate iron, for spring and summer delivery, and 1,600,000 pounds of castings.

Mr. Wm. Oesterlein, of Cincinnati, is inventor of a self-oiling and clutch pulley, he has just shipped one of his large pulleys to Isaac G. Johnson & Co., Spuyten Duyvil, New York, to be used in their works. Mr. Oesterlein is quite busy at present, principally on orders for the improved pulleys.

INDIANA.

The Bass Foundry and Machine Works, at Fort Wayne, are running to their full capacity, employing about 550 men and melting about 125 tons of iron per day. They are about completing an addition to their foundries 200 x 75 feet, giving them a total extent of 800 x 75 feet. This is exclusive of their machine and boiler shops.

ILLINOIS.

Chicago has eight barbed-wire fence manufacturing factories.

MISSOURI.

The Curtis & Co. Manufacturing Company, of St. Louis, makers of mill saws, have been behind orders for some time, but the recent additions to their capacity will enable them to keep up hereafter.

NEBRASKA.

Rapid progress is being made in rebuilding the Omaha Iron Works, recently destroyed by fire, and they are expected to be in running order by April 15.

KENTUCKY.

Mr. Fred J. Meyers, proprietor of the Covington Wire Works, at Covington, has recently removed his works to a new building. The new works have a frontage of 40 feet, by 150 feet in depth, and are six stories high, including the basement. This makes 36,000 square feet of space. With the machinery at present in use, Mr. Meyers is employing 100 hands. For the spring trade, bird cages, dish covers and fly traps are the goods principally manufactured. Of

H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

SARANAC HORSE NAIL CO.

Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

S. P. BOWEN, President and Treasurer.

J. W. LYNDE, Secretary.

PLATTSBURG, N. Y.

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BREECH LOADING GUNS.



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REMINGTON'S

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AMERICAN BREECH LOADING
ENGLISH " "
BELGIAN " "

GUNS

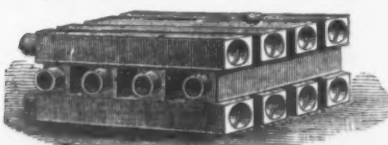
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ENGLISH MUZZLE LOADING
BELGIAN " "
FLOBERT RIFLES, Plain and Remington System.

BRITISH BULL DOG REVOLVERS, 38, 44 and 45 Calibre.

Agents for COLT'S and ROBIN HOOD line of REVOLVERS, BRIDGEPORT GUN IMPLEMENT CO.'S GOODS, UNION METALLIC CARTRIDGE CO.



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Hardware Specialties,
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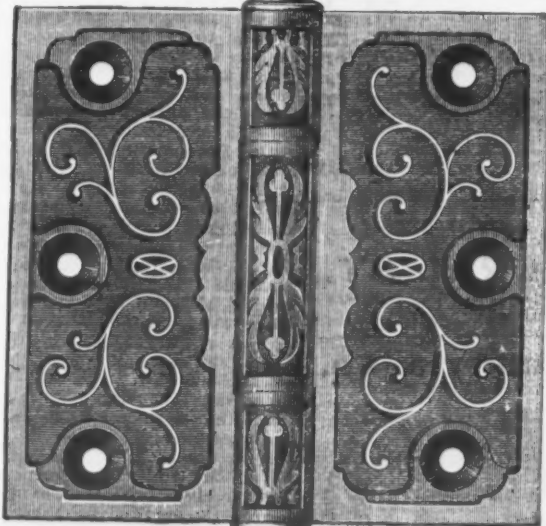


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Wyckoff Patent Wood Water Pipe,
Steam Pipe Casing,
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Established 1846. Send for pamphlet.
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Successors to
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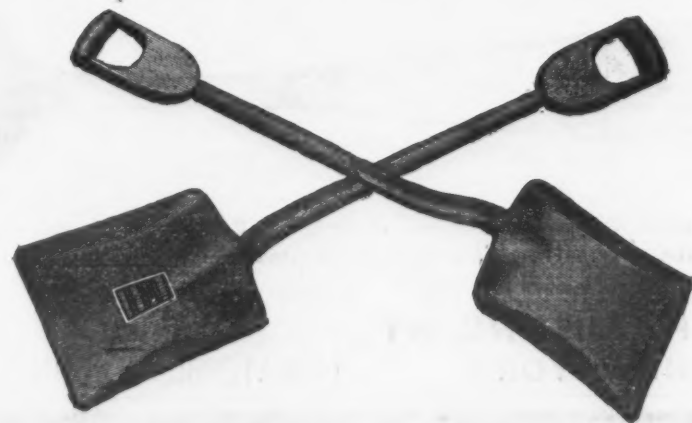


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PITTSBURGH.

SHOVELS,
SPADES and
SCOOPS.

PROVIDENCE TOOL CO.

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Wrist & Ankle Shackles,

REVERSIBLE

ICE AND FLOOR SCRAPERS,

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Providence, R. I.

The advantage of this scraper is that each cutting edge can be changed as fast as worn, and present a new and sharp cutting edge. Thus the scraper can be used and used to whole blades made available. It is especially useful in cleaning ice from sidewalks. Price, \$9 per doz.



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Manufacturers of
Calkers', Carpenters', Stone Cutters',
Tin, Copper and Boiler Makers'

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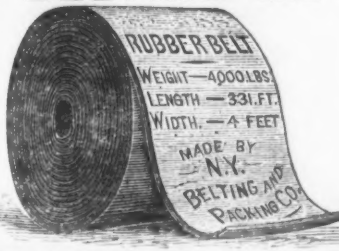
Hawking Beetles, Hawking and Calking Irons;
also all kinds of Handles, Sledge, Chisel and Hammer
Handles. AlsoCOTTON AND BALE HOOKS,
Patented Feb. 13, 1877; a new combination of Hooks.
454 E. Houston St., New York City.

THE FAR-FAMED
AMERICAN LUBRICATOR.
AMERICAN LUBRICATOR CO.
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Vulcanized Rubber Fabrics

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RUBBER BELTING and PACKING.

Machine Belting,
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Steam Hose,
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Car Springs,
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Gas Tubing,
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Wringer Rolls,
Billiard Cushions,
Grain Drill Tubes,
Emery Wheels.

This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than twelve years, also those for Armour, Dole & Co., Chicago, and Vanderbilt's great elevators of the New York Central and Hudson R. R., New York, being the largest belts in the world. We are now making an Elevator Belt, 35 inches wide and 200 feet in length, which will weigh over 18,000 pounds.

LINEN and COTTON HOSE,



Plain and Rubber Lined.

Circular Woven-Seamless Antiseptic RUBBER LINED "CABLE" HOSE and "TEST" HOSE, Vulcanized Para Rubber and Carbolized Duck, for the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c.



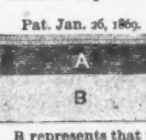
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Emery Wheels and Packing.

ORIGINAL
Solid Vulcanite
EMERY WHEELS

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.

The properties of these wheels are such that they can be used with great advantage and economy for cutting, grinding, and finishing wrought and cast iron, chilled iron, hardened steel, slate, marble, glass, etc. These wheels are extensively used by manufacturers of hardware, cutlery, edge tools, plows, safes, stoves, fire arms, wagon springs, axles, skates, agricultural implements, and small machinery of almost every description.

PATENT ELASTIC
Rubber Back Square Packing
BEST IN THE WORLD.

For Packing the Piston Rods and Valve Stems of Steam Engines & Pumps.

B represents that part of the packing which, when in use, is in contact with the piston rod. A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight, and yet creates but little friction.

This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.

Corrugated Rubber Mats and Matting,

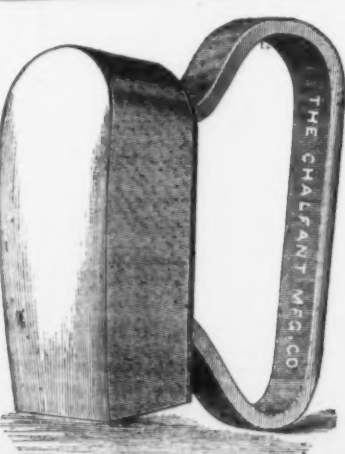
For Halls, Flooring, Stone and
Iron Stairways, &c.

This practical and indispensable article—especially for wear where exposed to ice, snow, or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, whilst the cheap inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address

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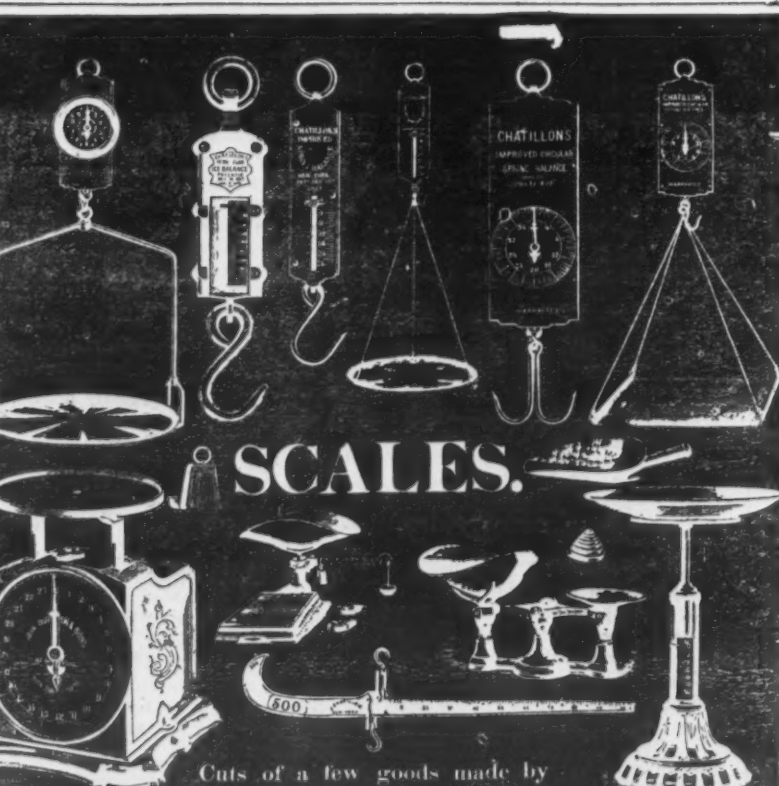
Celebrated Patent Gas Heating Smoothing Iron.

Can be heated on any ordinary gas burner in three minutes. People who have to board cannot get along without them.

Also manufacturers of the

Improved Troy Polishing Iron

for laundry purposes. For sale by Hardware and Housefurnishing dealers. Liberal discount to the trade.



Cuts of a few goods made by

JOHN CHATILLON & SONS, NEW YORK, U.S.A.

the latter article 6000 dozen will be turned out this season. Besides these, wire chairs, flower stands and a great variety of wire goods are being prepared for this season's trade.

An Interesting Question in Trade-Marks.

Judge Ludlow, of Philadelphia, has dissolved an injunction obtained by G. & H. Barnet against Daniel H. Kent & Co. and Alexander Krumbhaar, restraining the latter from using an imitation of G. & H. Barnet's trade-mark on files. A Philadelphia paper gives the following as a synopsis of the facts of the case:

The Messrs. Barnet have been extensively engaged in the manufacture and sale of files in the city of Philadelphia since 1863. During this time their business has grown from a small shop to a manufactory employing 100 hands, situated at Nos. 39, 41 and 43 Richmond street, and known throughout the United States and to a certain extent abroad as the "Black Diamond File Works." Since 1865 they have constantly used as a trademark upon labels placed upon goods, packages and all papers used in the business a figure in the shape of a lozenge or diamond, having a file printed across the face of it and the name "Black Diamond File Works." They have also stamped upon all their steel files and rasps the figure of a diamond between the words "Black" and "Works." Their manufacture has become known to the trade as "Diamond Files." In May, 1873, they registered this trade-mark in the United States Patent Office, but, under the recent decision of the United States Supreme Court, this registration is of no protection to them, and if any damage is suffered they must recover in the ordinary State courts.

Daniel H. Kent & Co., limited, are jobbers in hardware on Commerce street in this city. Some time ago they entered into an agreement with Alexander Krumbhaar, who conducted the Philadelphia File Works, at Sixteenth and Spring Garden streets, to manufacture a large number of files and to stamp upon the face of them the figure of a diamond inclosing the word "State." This agreement was carried into effect, and the files placed upon the market, inclosed in packages bearing upon them printed labels containing the words: "D. H. Kent & Co., limited, agents, Philadelphia, Pa., Diamond State File Works," with the symbol or figure of a diamond, containing the word "State" therein. On the argument before Judge Ludlow yesterday morning, affidavits were filed alleging that when Barnet's salesman in March of this year went on his regular spring trip, he was met throughout certain parts of this State with the objection that the Diamond files are not as good as they used to be, and could be bought from the retail dealers at a lower figure than he would sell them at. Upon investigation it turned out that these files were those manufactured by Kent, which had been mistaken by the purchaser for the Black Diamond files manufactured by the Barnets. Other affidavits were read, alleging the inferior quality of the "Diamond State Files," as compared with the "Black Diamond," and that the trade of the Messrs. Barnet was materially injured by this alleged piratical use of their trade-mark.

On the part of the defendants a number of affidavits were read going to show that the Spencers of England had used a diamond as a trademark before the Barnets had ever thought of doing so, and that therefore they could not claim originality of design; also, that there was no danger of any person of ordinary intelligence being misled by the similarity between the stamps upon the two files; that the distinction between the words "black diamond" and "diamond state" was so marked that no person who could read would ever be confused by it. In answer to this Mr. Henry M. Dechert, counsel for the Barnets, referred to the affidavits before mentioned, which had set forth that certain persons had been deceived. To meet the objection that the Spencers had used the symbol of a diamond, he argued that that was not in this country, and that the fact of the Barnets having enjoyed an uncontradicted use of it for the past 17 years should give them a good title to it against everybody else in the United States. At the conclusion of Mr. Dechert's argument Judge Ludlow said that he would not call upon the other side just now, but would take the papers home with him, and if he desired to hear further argument would notify counsel.

LABOR AND WAGES.

The Wason Manufacturing Company, Springfield, Mass., have made a readjustment of wages at their Brightwood shops, amounting to a general advance in the pay of the old hands of from 5 to 12 1/2 per cent. The advance will not affect the new hands, who have been employed at increased rates, and was made chiefly to equalize inequalities.

The pitmen of the converting works, at the Vulcan Steel Works, St. Louis, Mo., struck on April 5 for the scale of wages which they rejected early in March. They are still out, no effort having been made to get them in.

The strike at the Reading Hardware Co.'s Works, Reading, Pa., still continues.

A good practical joke is told on Mr. Carnes, of Kimberly, Carnes & Co., Sharon, Pa. It appears that during the late strike with the laborers at their blast furnace, so intent was Mr. Carnes on forcing the men to succumb, that himself and some other interested party undertook to run the furnace. Mr. Carnes assumed the "filler's" position at the bottom, but had filled but few loads when he also "struck," declaring that the men did right in striking for an advance, and that they were worth more than they demanded. "Honest confession is good for the soul," especially when brought about by circumstances like the above.—Labor Tribune.

The Amalgamated Association makes this official announcement: "There are three strikes now in progress in this district (Pittsburgh), at Demmler's, Brown & Co.'s and the Clinton mills, this city. The former is against a man who is claimed to be incompetent as a sheerman. That at Brown

& Co.'s is against the roller on the sheet mill for not paying his hands the price. Some rollers are generous enough, when an advance takes place, to pocket the lion's share, and give the hands what he—the roller—pleases. Of course, there are exceptions to the rule. The strike at Clinton is for the price called for on the sheet and jobbing mills' scale, the firm claiming that, inasmuch as they make skelp and pipe iron on said mill, they should not be held to the scale of prices for said orders. Each of these strikes has been legalized by the executive committee of the district, and we need not ask all men to keep away until these difficulties are settled."

The strike of the puddlers at Belle Isle, Richmond, Va., still continues.

Boiling, at Troy, N. Y., is \$5.75.

Under the new card at Pittsburgh the following rates of labor rule: Boiling, \$5.80; Muck Rolling, 72 1/2¢; Bar Rolling and Bar Heating, 76¢ each; Nail Plate Rolling, 66¢; Nail Plate Heating, 76¢; Muck Rolling, 26¢ off list; Sheet Rolling, No. 24, \$8.40.

The miners of Armstrong's works, B. & O. Railroad, Pa., are working at 3¢.

A number of the mines in the Shamokin district, Pa., are idle by reason of strikes.

Virginia Iron for Pittsburgh.—Captain Chester Parsons, vice-president of the Richmond and Allegheny Railroad Company, was asked by a Wheeling Register correspondent how his road could reach the Ohio River, after following the James River Valley from Richmond to Clifton Forge. The Chesapeake and Ohio Railroad already has the only direct route to the Ohio from that point. Captain Parsons answered: "We don't propose to strike the Ohio River in that direction at all. We intersect the Chesapeake and Ohio road at Clifton Forge, and we have all the facilities for the Western and Southwestern traffic we desire over that line. We propose to strike the Ohio River with our road, but we shall strike it at its head, at Pittsburgh, and in that direction reach for the trade of the great Northwest, as well as find in Pittsburgh a market for the immense deposits of iron ore along the line of the Richmond and Allegheny road, on the headwaters of the James. By looking at the map you will see that we have a direct route, and one that Nature has provided across the mountains to Pittsburgh. Leaving Clifton Forge, we pass through McGraw's Gap and fall on the waters of Jackson's River, in Bath County. Then, you see, Back Creek forces a passage for us through the Jackson River mountains and lets us to the main Allegheny at the head of the waters of Back Creek, where Nature has bowed the Allegheny mountains so that we cross into Pocahontas County, in West Virginia, without a tunnel or a deep cut. Thence we reach the headwaters of the Monongahela and follow their course to Pittsburgh over the line of the projected Pittsburgh Southern road."

Consolidation of Telephone Companies.—A consolidation of the Bell Telephone Company, of this city, and the private lines and telephone department of the Gold and Stock Telegraph Company, has been effected, negotiations for which have been in progress for some time past. At a meeting of the officers of both companies, held at No. 923 Broadway, recently, the valuations of the property, rights and privileges of each company were submitted and the consolidation finally effected. The Gold and Stock Company transfer all the telephone business done by them, together with the private lines under their control, to the number of 500, and the Bell Telephone Company put in all their property to the new company, which will control the entire business now done by each company. Both companies will be under one management, but the details of the new organization have not yet been completed. No name has yet been decided upon for the new company, but several are under consideration. An increase will be made in the capital stock, which will probably be put at \$1,000,000, but it is not definitely known what the amount will be. The stock of the Bell Telephone Company is now \$100,000, but its valuation is ten times that figure. There will be a change in the system of charges, but there will probably be no change in the rates to subscribers in this city. The actual transfer of the property will not take place until May 1, except in New Jersey and the suburbs, which will be transferred as soon as possible. The new company will begin active operations on May 1, and will have absolute control of the telephone business of New York city, together with the country for 33 miles around, which is considered the most valuable telephone franchise in the United States.

The First Rotary Blower.—The general use of the rotary blower or fan for creating an artificial draft, was the topic of a recent conversation on a train of the Fort Wayne road, between Mr. W. W. Waters, manager of the Presbyterian Book Store, Liberty street, and the writer. The uses of the rotary blower in the workshops of the country are endless, and the origin of the idea is not altogether clear. But from the gentleman mentioned above, the following information on the subject was obtained, and from which it is safe to assume that a Pittsburgher was one of the first, if not the very first, to conceive the idea of the revolving fan. In 1824, Mr. Oran Waters came to Pittsburgh from Massachusetts, and engaged in the business of making spades and shovels in Lawrenceville. Shortly afterward he removed to Eleeceville, two miles up Chartiers Creek. This was in 1836 or 1837, and in one of those years Mr. Waters rigged up a fan that turned by water power, and furnished the draft for his forge fires in making axes. In his diary Mr. Waters alludes to the success of his invention, and its superiority over bellows. He also tells of the interest aroused by the novel wheel, causing crowds of persons to visit his works every day from the city and country. Unfortunately Mr. Waters did not protect himself by a patent, or his fortune would certainly have been made. He died about five years since, Mr. W. W. Waters being one of his sons.—Pittsburgh Telegraph.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, April 15, 1880.

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JAMES C. EAYLES . . . Editor.
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CONTENTS.

First Page.—The "Standard" Grain Scale.

The Publication of Consular Reports.

Third Page.—Private Brands of Tin Plates.

Fifth Page.—On the Hardening, Tempering and Annealing of Steel.

Seventh Page.—On the Hardening, Tempering and Annealing of Steel (Continued).

Eighth Page.—On the Self-Feeding Ratchet Drill. Steel Making in China.

Ninth Page.—The Present Position of the Model Question. Sixteen Weighted Horseshoes.

Tenth Page.—Industrial Items.

Eleventh Page.—An Interesting Question in Trade-Marks. Labor and Wages. Virginia Iron for Pittsburgh. Consolidation of Telephone Companies. The First Rotary Blower.

Twelfth Page.—Premature Announcements. Our Imports of Iron and Steel. The New Card of the Western Iron Association.

Thirteenth Page.—"Boona." The Position of Lead. Settlement of the Controversy on Hoop Iron Cut to Lengths. Actual Progress of the Hudson River Tunnel.

Fourteenth Page.—Failures During the First Quarter of this and Previous Years.

Fifteenth Page.—Trade Report. General Hardware.

Sixteenth Page.—General Hardware (Continued). British Iron Market. Iron. Metals. Coal. Old Metals. Paper Stock, &c.

Seventeenth Page.—Exports. Imports. Coal. Philadelphia. Pittsburgh.

Eighteenth Page.—Pittsburgh (Continued). Chattanooga. Boston. Cincinnati. Louisville. St. Louis. Baltimore. Richmond. Our English Letter.

Nineteenth Page.—Our English Letter (Continued).

Twentieth Page.—The Iron Age Directory.

Twenty-first Page.—New York Wholesale Prices.

Twenty-second Page.—New York Wholesale Prices (Continued).

Twenty-third Page.—New York Wholesale Prices (Continued).

Twenty-fourth Page.—Philadelphia and Pittsburgh Hardware and Metal Prices.

Twenty-fifth Page.—Boston Hardware and Metal Prices.

There is an effort in the West to create the impression that the strike of the puddlers in Central Pennsylvania ended in a compromise offered by the puddlers themselves, or, in other words, that the mills resumed work on terms offered by the workmen. A late issue of a Pittsburgh paper ascribes the closing of the strike to the efforts of Mr. Jarrett, the president of the Amalgamated Association, and the rate at which work was resumed (\$5.50) as a compromise rate offered by him as the representative of the manufacturers. This is anything but the truth. The result of the strike was a square defeat of the puddlers, and a resumption of work at the prices offered by the manufacturers at the time work ceased. When the strike began the mills had been paying \$5 for puddling. The men demanded \$6. The mills offered \$5.50, and the men refused it and struck. After two weeks of idleness, work was resumed at \$5.50, just what the manufacturers offered. The moral of this is that the Amalgamated Union cannot lead the Eastern manufacturers the same dance that

they lead the Western. The former have more control of their mills and business than the latter.

Premature Announcements.

Experience has long shown, and daily observation confirms it, that nothing is more inimical to the success of any undertaking than premature announcement. It is an important part of what in some departments of journalism is called "newspaper enterprise," to keep ahead of events, rather than to record them. After a thing has happened anybody may know about it; but to say it is about to happen, and to announce that great things are about to be done, or have been done, before the proof is ready that they are even possible of attainment, never does any good, and often does a great deal of harm. It cannot even be called well-directed enterprise on the part of newspapers which pride themselves on their accomplishments in this line. Premature announcements are essentially untrustworthy, and are more likely to be contradicted than verified by the actual subsequent happenings. They usually mislead the public by exciting expectations which are disappointed, and thus bring discredit upon the honest and intelligent enterprise which seeks to know and proclaim the truth.

The daily press of this and other cities is constantly furnishing us illustrations of the mischievous folly of "too much previousness" in news gathering. This is most conspicuous, perhaps, in the startling news which from time to time is obtained from Menlo Park. Mr. Edison is unquestionably a remarkable man. His record of successful invention in the department of electric telegraphy is a grand one, and should be accomplished nothing more during the remaining years of his life, his name will be remembered and honored as that of a genius who did great things. But Mr. Edison undoubtedly lacks good common sense in business matters, and is conspicuously the victim of too much of a false quality of newspaper enterprise. Before he was in a position to attract any considerable amount of public attention he had time to fully develop his inventions, and when they were given to the world they startled the community by their completeness and success. Now he is watched with an attention which gives his every word and act especial interest, and his incautious gossip with newspaper reporters who are incapable of understanding what he tells them, and who rush back to their offices with certain undigested scraps of information out of which to make a wonderful story about what Mr. Edison has done, is doing or is about to do, has placed him in a false position before the community. In nothing have his announcements been more premature, or more destructive to his reputation, than in the matter of the electric light. It is too soon to say that his lamp is a failure, for he may make it practical at any moment; but it is quite safe to say that it is not yet a success, and that any expectations based on the announcements which, if not authorized by him, were permitted to pass unchallenged and uncontradicted, have been disappointed. After his inventions relating to the phonograph and telephone, there was probably no man living whose announcements would have been received with more faith than his. The simple statement that he had solved the problem of providing a low power, cheap electric light sufficed to convince the masses that a new era in the illumination of dwellings and public thoroughfares was at hand, and created an unprecedented panic in gas stocks. It was months before the fact was realized that Edison's assertions had no adequate foundation—that he was not in possession of any new methods or apparatus which gave promise of more success than many other inventions brought forward by less famous men. It would be idle to deny that public faith in the ingenious inventor was shaken, and yet confidence in him was still so great that when it was suddenly announced that a surprisingly simple lamp was the fruit of his researches, popular excitement again ran high. Stocks of the company formed to develop and use the new system were rushed up to prices representing their face value hundreds of times. The eager controversy of those days, and the glowing reports of irresponsible and ignorant reporters, are too fresh in the minds of all to require more than a mention. Week after week and month after month passed, and not one single strictly scientific, authoritative statement, so urgently called for, reached the outside world. The day for the convincing public exhibitions did not come, while rumors affecting the efficiency of the lamp became more and more disquieting. Apart from the merits of the invention, upon which conflicting scientific testimony is now at hand, it is patent to all that Mr. Edison has done himself and his reputation immeasurable harm. This is to be regretted, not so much on his own account, but because of the great disadvantage at which it puts those who are struggling for the recognition of improvements of real merit.

The severe injury which an incomplete knowledge of the circumstances bearing upon an invention may entail, and the necessity of complete mastery of all the details attending a new process or a new apparatus, is pointedly illustrated by the history of the Bessemer process for the manufacture of steel. Bessemer, one of the greatest, and certainly one of the most successful, inventors of modern times, was by no means a novice when he attacked the problem of

producing high grades of metal by cheaper means than those employed at that period. He had learned by early and severe experience by what dangers the success of those who struggle for improvement is surrounded. Soon after the Crimean war he began a series of experiments, assisted by Longdon, in which he sank, during two years, as much as \$15,000 to \$20,000, attaining results which were deemed so encouraging by a friend, Mr. George Rennie, that the latter advised him, and finally prevailed upon him, to make them public. Accordingly, Bessemer read at the Cheltenham meeting of the British Association, in 1856, a paper which embodied the main points of his invention. It created a profound sensation, and while his statements were received by many with incredulity, or even scorn, so many had faith in his invention that he received within three weeks the sum of £26,500 for licenses. In all parts of England ironmasters constructed crude vessels and commenced to blow pig iron—and all failed. Bessemer himself found that there was a practical difficulty, but he could not tell what. With the money obtained he quietly set to work making experiments, until within two and a half years he had expended £16,000. He again brought it before the public, and to use his own words, was surprised "to find that no one believed in it; no one seemed to have the smallest confidence in it. Everyone said: 'Oh, this is the thing that made such a blaze two or three years ago, and which was a failure.' Had I not been furnished with capital by the sale of licenses, my experiments could never have been carried on. I had immense difficulty in persuading anybody to touch it; indeed, neither the steel-makers nor the iron-makers would take it up after the lapse of 'two years.' It may be argued that the history of Bessemer's invention furnishes, better than any other, convincing proof of the necessity of bringing forward inventions when they are still incomplete; that there is a period when the labors of the inventor demand public recognition and financial encouragement, and that, had not Bessemer succeeded in obtaining a very substantial encouragement by submitting his results to those interested, he would never have been in a position ultimately to make his process a grand success. Very few inventors, it is true, have, or can command, the means to carry their ideas to that stage of practical development when there is no longer doubt as to complete success. It is often impossible for them to continue their work until they are prepared to step before the world with a *fait accompli*. As a class, inventors are not generally good business men. They are extremely sanguine. They generally overrate the value of their discoveries, and entertain exalted ideas as to the financial results which will follow the introduction of their improvements and the share that is due to them. Underestimating minor practical difficulties, and eager to reap the rewards in store for them, they confidently place before the public their crude ideas. The conservative spirit of those whom they address, a feeling which often approaches hostility, subjects their innovations to severe and searching criticism, and as the statements of those who point out practical difficulties are generally backed by mature experience, the imperfections are brought out into full light. Matured inventions pass through such an ordeal triumphantly and the inventor is only the gainer; to crude ideas, however, such a test is often fatal. The fact that the criticisms offered are just, creates an adverse opinion in the majority, which only striking subsequent success can overcome; it alienates the friends and backers of the inventor, and in many cases shakes the faith of the latter in himself and warps his judgment. The principal argument which was brought to bear upon Bessemer to induce him to make his researches public was: "Whatever your difficulties are in practical detail, the moment a practical ironmaster sees this wonderful invention, he will at once supply all those details, and the thing will be done." The result was, to say the least, discouraging to this idea. Instead of offering suggestions, those present severely and almost unanimously condemned, either in whole or in detail, the idea of producing malleable iron or steel by blowing air through pig metal. No points affecting practical details were submitted or discussed by them; and an examination of the records of technical societies, or of discussions in the press, will show that those introducing new methods or machinery have little to hope for in that direction. Such gratuitous aid or spontaneous assistance need not be looked for; on the contrary, inventors must run the gauntlet of sharp and often unjust criticism, and derive such benefit as they can from it. It is a delicate matter to determine at what stage of development hostile comment ceases to be dangerous and is likely to be productive of good. We believe that, owing to natural and pardonable confidence on their part, inventors are in this very important matter inviting, by premature announcement, much distress to themselves, burdening themselves with the additional labor of dissipating prejudice of their own creation, and often bringing about absolute and complete failure. While we would caution inventors themselves, there is one large class upon whom the necessity of calm judgment should be particularly impressed. We refer to those who come to their assistance while the improvement is still in its earlier stages, the capitalists who with

their funds aid in the elaboration of details and upon whom the business management generally devolves.

It is unnecessary to multiply instances in which premature announcement has led to results which those who are interested in whatever promotes progress cannot but deplore. We see the same mistake made in thousands of cases which are of minor public interest. Inventors rush into print and claim success long before their experimental results warrant more than a hope that success is possible. When fraud is intended, and the alleged inventor hopes to deceive some one into buying his invention or supplying him with money, there is a reason for premature announcement which is easily understood. But the honest inventor or experimenter who is seeking practical results, cannot make a greater mistake than to claim success before he has reached it. Explanations and apologies are destructive to an inventor's reputation. The public loses faith in a man who does not foresee and overcome the difficulties which stand between him and success before he claims to have succeeded. His friends and supporters lose confidence in him, the public loses interest in his work and are suspicious of his subsequent assertions; the inventor is discouraged and disheartened, and in many cases, when success was originally possible, failure results from a too eager proclamation. In some instances, as, for example, the Keeley motor, the astounding, immeasurable, inconceivable credulity of those interested survives any number of failures on the part of the alleged inventor to redeem his promises; but this is not the usual experience, nor is the Keeley motor a common invention. As the rule, it takes years of conclusive and demonstrated success to counteract the bad effects of premature announcement and to re-establish the confidence which is once shaken by disappointment.

Our Imports of Iron and Steel.

At the present time, when the fact that our markets are largely influenced by the quantities of iron and steel imported into this country is fully recognized, and decisive action has been taken on the part of some producers, a close examination of the figures, as revealed by official import statistics, is very important. With a view to dispelling many erroneous impressions on this subject, and to showing exactly which articles are most seriously affected directly, we present the following data. Before entering into a more detailed discussion of the principal items, and the history of the growth of the import trade as exhibited by the records of the months since the revival, we would present the following table showing the total imports during the twelve months ending Dec. 31st, 1879 and 1878 respectively, all the figures being given in tons of 2000 pounds.

	1879.	1878.
Pig iron	340,672	74,464
Castings	61	69
Bar iron	43,840	33,340
Boiler iron	91	1
Band, hoop and scroll iron	1,031	7
Railroad bars or rails, iron	19,009	1
Sheet iron	5,419	858
Old and scrap iron	221,312	5,688
Wires	892	20
Steel rails	25,057	616

For the following articles the values only are given:

	1879.	1878.
Hardware	\$145,356	\$96,170
Machinery	715,314	555,174
Steel ingots, bars, sheets and wire	635,515	494,696
Cutlery	1,931,950	1,135,784
Files	1,360,630	1,126,694
Saws and tools	105,581	108,690
Other manufactures of iron and steel	5,939	7,356

The increase has been most strikingly large, as will be seen, in old and scrap iron and in pig iron, while bar iron, band, hoop and scroll iron, iron and steel rails, and sheet iron have also increased considerably. The same applies to steel ingots, bars, sheets and wire, hardware, machinery, fire-arms, cutlery and manufactures not elsewhere specified, while files and saws and tools have actually receded.

A closer examination of the increase, as presented from month to month, will be of interest. It is to be regretted that the statistics thus far published carry us only to the end of January, so that the imports for succeeding periods cannot be given. From the following table it will be seen that while during the months from July, 1878, to February, 1879, the quantities of pig iron imported exceed only 10,000 tons in one single case, the increase in the corresponding periods of 1879 and 1880 is surprisingly rapid, reaching its maximum, or 94,447 tons, in November, and rapidly declining since then:

	1879-80.	1878-9.
July	21,331	5,615
August	14,309	6,807
September	28,144	6,654
October	60,075	10,227
November	94,447	8,665
December	73,956	7,491
January	47,590	7,738

In bar iron the flow of material to this country from abroad set in at a later period (in November), and it had not in January passed its maximum, which was more suddenly and more rapidly reached. It will be noticed also from the following table that the increase is not, as compared with the preceding year, so great as that observed with pig iron:

	1879-80.	1878-9.
July	1,557	2,999
August	2,768	4,626
September	3,221	2,352
October	3,908	3,183
November	11,574	3,597
December	16,429	3,617
January	16,948	9,319

A sudden jump in the imports took place in sheet iron also, from the month of October to November, but it does not seem, from the returns, that it was possible to maintain the rate thus established:

	1879-80.	1878-9.
July	582	105
August	351	111
September	279	93
October	1,813	142
November	1,813	113
December	1,693	72
January	1,256	72

It will not be necessary to state the imports of iron and steel rails for the corresponding periods of 1878 and 1879, as the total imports during 1878 did not go beyond a few tons. There is much irregularity in the figures both for iron and steel, as the following table shows. It is worthy of notice, however, that the shipments of steel rails to this country were commenced some months before those of iron rails, and that the quantities are really insignificant:

	Iron Rails.	Steel Rails.
July, 1879	3,146	5,134
August, 1879	6,399	3,369
September, 1879	6,792	2,035
October, 1879	4,205	2,035
November, 1879	1,693	2,035
December, 1879	5,044	4,552

The most remarkable increase is that shown by old and scrap iron. It was well known that Europe and India were thoroughly scourged by the agents of American importing houses, and the figures given below clearly prove how successful they were. We may add in this connection that it is generally understood that the stocks in first hands, in all countries but Russia, have been pretty effectually cleared away, and that the main question at the present moment is how much can be profitably drawn from the empire of the Czar:

	1879-80.	1878-9.
July	2,994	660
August	5,422	436
September	26,730	356
October	31,603	635
November	61,375	397
December	82,330	1,230
January	56,879	290

From these figures it would seem that the climax has been passed, and that shipments to this country are falling off. This may be said to apply to all articles of iron and steel, and it must be seen how far the decline in this country will limit these excessive importations. That they will continue on a scale larger than that of corresponding periods of previous years there is little doubt. This movement will be closely watched by American manufacturers, who, to a certain extent, have it in their power to control it by cautious and judicious management.

The New Card of the Western Iron Association.

The action of the Western Iron Association at its meeting last week, in taking the course foreshadowed in these columns and reducing the card on iron \$17.92 per ton, eight-tenths of a cent per pound, or 20 per cent., can certainly be classed as decided and radical. It is stated that the action was unanimous; that a vote showed but seven out of over 50 mills represented as opposed to 3.2 cents, these seven at once yielded, one moving to adopt the 3.2 card unanimously, and it was so carried.

The cause of this action has been a subject of considerable speculation, but it is not hard to explain. The mills could not get 4 cents for their iron, and hence put the price down at once to a figure at which they thought they could sell iron. It must be confessed that this radical way of dealing with the market, this method of standing up square and owning by their action that they realize the condition of trade and have the strength and courage to accommodate themselves to that condition, has not always characterized the acts of the Western Iron Association; but they have done it this time, and in so far have shown that a healthy condition of affairs exists West—much healthier, indeed, than when iron was running up half a cent a pound at a time. It may sound strange to say that so radical a reduction as eight-tenths of a cent indicates a healthy condition of the market, but a little consideration will show that the statement is warranted. When manufacturers have the strength and courage to meet the market, it is because trade is healthy and the outlook promising. It is when trade is demoralized and the outlook dismal that manufacturers try to cheat themselves and others by holding to a fictitious price, rather than meeting the conditions as they exist.

It is not our intention to enter into a consideration of the causes that made it impossible to sustain the 4-cent card. We have indicated these in previous articles. There is a feeling abroad that the 4-cent card was a mistake, but this feeling is not shared by those who know all the circumstances that led to its adoption. The shrewdest of the Western iron manufacturers insist that the action of the association in advancing the card was wise. At the time the advance was made bar iron was selling rapidly and freely at 3.75 and 4 cents, even though the card was 3½ cents. This would certainly seem to indicate that a 4-cent card could be sustained. It also seems probable that there were some causes that do not appear on the surface that led to the action. It certainly is reasonable to suppose that an action so nearly unanimous, taken by so able a body of men as compose the Western Iron Association, must have been warranted by existing conditions. It is believed that the result of this action will be to stimulate trade, and perhaps

render possible an advance in the card before many months. Of course it is difficult to judge whether this belief of the members of the association is well founded. It will depend largely on the course of trade in England.

"Booms."

The term "boom," though of very recent origin, and having no better warrant than is found in general usage, promises to be a permanent addition to our vocabulary of terms descriptive of conditions or states of trade. It is the opposite of "demoralization," which seems to have been of military origin, and to have crept into commercial usage because it met a want that no other word perfectly filled. We had rung the changes on "demoralized" for some years, and when a condition came which contrasted sharply with that previously existing, we needed a new word, and it came. Somebody used the term "boom" to describe the revival of business, and in a week it had gained unquestioned and unchallenged currency.

If we curiously inquire into the etymology of the term which has so suddenly become a part of our language, we find that it possesses a peculiar significance which warrants its employment. It is, indeed, especially appropriate. The word "boom" is a nautical term, and is applied to the spar which extends the bottom of the sail. By means of the boom the sail is held out to catch the favoring breeze which wafts the ship on her prosperous course. But winds are uncertain things. They shift sometimes with surprising suddenness, and this often causes no little consternation to the unwary. Under such circumstances a boom is extremely apt to "jibe"—that is, to swing over more or less violently to the other side—and when this happens those who are not watchful are very apt to be knocked overboard into deep water. This is exactly what a "boom" in trade does every time. It spreads the sail to catch every puff of wind that is moving, and seems to be as solid and substantial as the mast on which it swings; but when the wind shifts, or the ship changes her tack under the guidance of an unskillful pilot, the boom is almost certain to jibe, and when it does it always finds a great many people on deck who were just in the right position to be knocked overboard without notice. We see, therefore, that the term "boom" as applied to a sudden advance in prices coupled with a sudden increase of demand, is much more accurately descriptive than it is commonly supposed to be by a majority of those who use it.

But it is the condition of trade which is meant when we say a "boom," rather than the etymology of the word, that we propose to briefly consider in this article. Booms are pleasant while they last, but they are very uncertain things, and are almost always followed by a reaction which is disastrous to all concerned. A pendulum pushed violently to one side never swings quite so far the other way, as a little of its momentum is lost in overcoming friction. A reaction from a boom following extreme depression may not carry us back to extreme depression again, but it will go a good deal further in that direction than it would if the recovery had been less sudden and the advance in prices more uniform and less rapid. Men lose their good judgment in times of great commercial activity. They are excited and eager to make the best possible use of the opportunity while it lasts. Buyers are as eager as sellers—often more so—and we do not infrequently find them doing all in their power to put prices up by bidding against themselves. When depression is upon us, few can see any hope beyond; when a boom comes few realize that it cannot last indefinitely. But booms are almost always short-lived. They encourage over-trading, stimulate production to the utmost limit, induce large importations of everything which can be procured abroad, and long before it is generally expected the boom jibes, and a great many people find themselves overboard. The boom of 1871-2 jibed in the panic of 1873. The boom of 1879-80 has jibed already, and if with less shock and disaster than might have been expected, it is because of generally favorable conditions of wind and tide. But a great many reckless speculators are now floundering in deep water, heavily loaded with iron and other kinds of merchandise, bought under the impression that the boom would not jibe for a long time to come. Fortunately, the advance was not wholly unwarranted or fictitious. Consumption continues large and the country is in a generally prosperous condition. Were it not for this, our sudden revival would probably have been followed by a sudden collapse, and we should now witness a state of affairs worse than the settled depression of 1878 and 1879.

It is useless to search the history of trade movements for the "lesson" they teach. These sudden fluctuations result from causes practically beyond control. If one man or one class of men could direct the policy of the business community, good advice might be useful and profitable. But it takes the action of thousands to make a boom, and about all that can be expected of a business man is that he shall do what seems best at the moment. He may deprecate and deplore a too sudden advance in prices, but it would show no wisdom on his part to sell his goods for less than they were worth in the market. Moreover, he could not thus restrain the advance, as speculators would buy him out

and sell his goods again at the highest prices they would bring. He must conform to circumstances, and about all the advice we can offer any one as to what to do or what not to do at such a time is to keep one eye on the boom, and be all ready to duck when it jibes. It may swing over suddenly, or it may do so leisurely and easily. In either case it is the part of wisdom to watch it closely, and stand ready to do whatever the occasion calls for.

Three strikes were in progress in the iron mills of Pittsburgh last week—at the United States Iron and Tin Plate Company, Brown & Co.'s, and Graff, Bennett & Co.'s. The first was against a man whom the Amalgamated Association, in its assumption of superior wisdom, decided was not a competent shearman, and so they ordered his discharge. The company, thinking they were as good judges of this as the men, and at least as much interested, mildly suggested that it was none of the association's business. It was not said so bluntly as this—in fact it was very politely put—but the strike came and it has been countenanced by the association. The one at Brown's mill was against the "boss roller," the charge being that he did not pay his under hands the same rate as was paid in the other mills. Under the peculiar methods of Pittsburgh mills, the rollers hire and pay the catchers, roughers, &c., about the rolls, and, as a result, any trouble that may arise between the rollers and under hands may lay the entire mill idle. It is thus a matter in which the proprietor can take no part, though he is the one most concerned. He must stand by, put his hands in his pockets and wait until the workmen conclude to settle their troubles and allow the mill to start. He would not even be allowed to get new hands and start the mill, though his action, so far as the cause of the strike was concerned, was approved. He may pay the full rates according to the scale, but the least trouble between these men stops his mill and leaves him helpless. A system that permits this, or even makes it possible, is a most pernicious one and is doomed. It cannot continue, because it is opposed, in so far as it permits this, to all justice and equity. When, as is probable in these cases, the real strike is against a non-unionist, the stopping of the mill is still more indefensible. Such things can have but one result. Pittsburgh manufacturers have fostered and made unionism possible, and it exists there as at no other place in the country; but they have begun to question whether peace purchased at such a price is not too costly. Should the issue ever be joined it will be a severe struggle, and the end will be that the union will go under, because its own acts have made it right that it should be destroyed. *Quos Deus vult perdere, prius dementat.*

The result of the recent political changes in England upon the trade of that country and of Europe, has been a subject of considerable anxiety and speculation in this country, as the future of our trade will depend largely on the course of the iron trade of England. The same subject has occupied the attention of the commercial journals of England, and the cable dispatches, which give the tone of these journals, seem to regard the result of the elections as destined to have a favorable effect on business. A dispatch of the 12th represents the *Economist* as saying: "There is a growing tendency to regard the Liberal success at the Parliamentary election favorable to business, and it appears probable we are on the verge of another outburst of speculation." We cannot tell all of the reasons that may have led the *Economist* to this opinion, but some of them are manifest. There always is a feeling among a certain class that a change in administration, when business is depressed, must improve affairs. The depression is charged on the government, and a change is likely to impart a more buoyant and hopeful turn to business. It is also remembered that the last Liberal government went out of power with a surplus of some £5,000,000, and the Beaconsfield government leaves office with this absorbed and a deficit of some £9,000,000 besides. These facts lead to the belief that the incoming government will be economical, reduce expenditures and thus stimulate industry, by relieving it of some of its burdens. At the same time, the prospects of peace which Mr. Gladstone warrants us to hope for promise an increased activity in the line of improvements. In India and South Africa, where the government's resources and income have been spent in war, the assurance of peace will give funds to carry on needed public works and stimulate private enterprises. Peace in Europe will have a similar effect, and if the harvests of 1880 realize their promise, one great source of distress will be, if not entirely removed, at least modified, and the demand for the products of England's workshops will be largely increased.

Shortly after the beginning of the present session of Congress, Mr. White offered in the House a resolution to correct a misconception which Secretary Fessenden placed on the law regarding the import duty on iron coated with tin or terne. The *Iron Age* has commented several times on the injustice of Mr. Fessenden's ruling, and the enormous loss which the government has sustained in consequence. The law which was enacted in 1864 originally provided that "tin plate and iron, galvanized or coated with another metal, shall pay 2½ cents

"per pound." Mr. Fessenden decided that the clerk who engrossed the bill made a mistake in punctuation by placing a comma after the word "iron," while it should have been placed after the word "tinplate," and that tinplate, as well as iron, must be coated with another metal in order to come under this provision, and that tin and terne plates should be brought in under the provision for tin in sheets or plates, pure tin or terne, at 1-10 cents per pound. Mr. Fessenden evidently did not know that tin plates are iron plates coated with tin, and that they would remain iron coated with another metal in spite of his decision. This latter fact Mr. White wished to establish, and we hope that the Committee of Ways and Means will find time during the session to give this important matter the attention it deserves. It is obviously unjust that the Secretary of the Treasury's absurd ruling should be permitted to change the evident meaning of the law.

The uncertainty in which the policy of Secretary Sherman and the lack of action on the part of the Ways and Means Committee left the hoop iron manufacturers and buyers, has already had its legitimate result in the enforced idleness of the hoop mills of the country. The large hoop mill of Painter, at Pittsburgh, which for years has made no bar iron, finds itself so entirely without hoop iron orders and without prospects of any, that it has again begun the manufacture of merchant iron. The mills of Clark and Lindsay & McCutcheon, which make hoop iron exclusively, and the hoop trains in the other mills of Pittsburgh and those at other points in the West, are either idle or are running very light. The Eastern mills are not so badly off as the Western, as the trade of the former has been more of a jobbing trade for all kinds of industries, while the latter have had the bulk of their orders from the Cotton Tie Company and from the Standard Oil Company for bands. The Amalgamated Iron Association have taken this subject in hand, and have appointed a delegation to visit Washington and confer with Secretary Sherman and the Ways and Means Committee, and their influence will probably be potent in bringing about some change. They represent a good many voters (and from Ohio, too), and the Secretary may conclude that there may be some relation between hoop iron and mending fences which it will be well for him to investigate.

The draft for a new bankrupt law, made by Judge Lowell, of Boston, which we published March 25, has been introduced into the Senate and is now pending before the Judiciary Committee, which is said to be almost unanimous in its favor. Congress seems to realize the need of some uniform bankrupt system, and will scarcely adjourn without action. The chief cause of complaint against the systems of the several States is that non-resident creditors cannot obtain justice, and it is claimed that on the average fully 50 per cent. of claims against bankrupt estates can be shown to come from non-residents.

The Position of Lead.

The enormous increase of lead consumption during 1879 in the United States alone, estimated at something like 20,000 tons, had the effect last fall of raising the value of domestic lead about a hundred per cent. from the lowest previous point, and at this advanced price it has remained tolerably steady, although lately giving at times some signs of weakness. A few statistics will best show the entire movement of 1879:

	Tons.	Tons.
Stock, Jan. 1, 1879.....	8,000	
Production in 1879.....	84,000	
Stock, Dec. 31, 1879.....	92,000	
Consumption in 1879.....	90,000	
Consumption in 1878.....	70,000	

Increase of consumption in 1879 over 1878, 20,000.
Production in 1879..... 84,000
Production in 1878..... 64,000
Excess in 1879..... 20,000

While the advance here had been greater and more rapid than in any previous year, under the stimulus of circumstances altogether unexpected, and from all appearances quite legitimate, although to some extent aided by speculation, it was slower in Europe, and instead of rising 100 per cent. there, the advance on the other side was about 40 per cent.; but in Europe the price during the greatest period of depression had not dropped to a figure comparatively as low as had been the case here; hence there was not so much lost ground to be recovered there, and the improvement was of less magnitude.

The European markets are very much ruled by the output in Spain, and the latter country is now producing a very large amount of lead. The export in 1879 was 100,336 tons, against 90,842 tons in 1878, an increase of about 10,000 tons, or about four times our own increase. At considerably higher prices than those ruling during the greater portion of 1879, it is fair to represent that the Peninsula will show a still larger increase this year, unless a great decline in the value of the metal should occur during the next six months.

The import and export of lead into the United Kingdom in 1879 was:

	1879.	1878.	1877.
Tons.	Tons.	Tons.	Tons.
Import.....	102,000	100,233	94,412
Export.....	38,650	34,444	44,465
Of this export there went to the East			
Madras.....	261	227	19
Calcutta.....	52	764	229
Bombay.....	646	280	252
China.....	5,342	9,913	14,709
Japan.....	351	869	4,760
Singapore and Penang.....	351	215	300
Total.....	7,543	12,269	27,419

While the import was only about 2000 tons larger, the export was about 4000 tons in excess of 1878, notwithstanding a falling off in the Eastern demand of about 5000 tons. The shipments from England to the Continent must have been unusually heavy, consequently, and while this was the case, Spain has been shipping very extensively to Mediterranean ports, chiefly Marseilles. This shows that the lead movement was unusually active in Europe last year, and the metal has, therefore, displayed a vitality in the more civilized countries in 1879 greater than in any year we remember, and at a time when Europe has been enjoying profound peace and had no great war in prospect. It, therefore, seems to demonstrate that peace is more favorable to the lead producer than war or the prospect of it.

Much is due to the general introduction of water works in Europe during the past few years and the modern improvements connected with them, and to the ease in the money markets, which has enabled even the smaller communities to raise money on fair terms for such useful purposes. In this country, where a new building era, stimulated by more prosperous times and a rapidly increasing immigration, has been improving for a year or more, lead has been specially benefited by the change thus wrought, and those who had confidence in it when it had sunk to such an unreasonably low value have been rewarded. But present prices can hardly fail to increase production to a formidable aggregate during the current year, and the metal will, on that account, have to be watched very closely. Much of a spring trade need not be looked forward to, the mild winter having favored building all along, spreading the consumption of lead over months during which it usually stops. Still there will be some spring demand at least to help us along for the time being. While Spain gives assurance that there shall not be a lack of supply on the other side, our great West will look out for our domestic requirements, and we really cannot see much prospect for a high ruling of lead prices on either side of the ocean, unless a speculative movement should temporarily interfere with the even course of trade and monopolize the metal here and in London. From latest advices, which reach us as we go to press, it would appear that such a movement has actually been organized abroad, a large syndicate, said to embrace all the great producing districts, having been formed to hold and advance prices. It is announced by cable that an improvement in the price of lead in London, to the extent of 10 shillings, has taken place in consequence, and our markets have, in sympathy therewith, assumed a firmer tone.

Settlement of the Controversy on Hoop Iron Cut to Lengths.—Cotton Ties not Affected.

(From our Special Correspondent.)

WASHINGTON, D. C., April 14, 1880.

The Committee on Ways and Means were yesterday notified by the Secretary of the Treasury that unless action were had by Congress within the time specified (April 17) in his recent communication, an order would be issued to collectors of customs to collect duty on this article at the specific rate. During the past week Representative Tucker and his colleagues on the sub-committee, Representatives Garfield and Dannel, have made repeated efforts to formulate a proposition upon which an agreement might be reached and reported to the House in the form of a bill. The Tucker proposition to permit all hoop iron cut to lengths, contracted for prior to March 12, to be entered at the ad valorem rate during the remainder of the calendar year, was offset by a substitute by Mr. Garfield, constraining the law to embrace cut hoops in the list of specific duty imposed upon hoop iron, and that all contracts prior to March 12 should be admitted under the ad valorem rate. Upon Mr. Garfield's proposition the vote was—ayes, Garfield, Kelley, Frye, Conger, Phelps and Dannel—6; nays, Wood, Carlisle, Tucker and Mills—4. Mr. Gibson was absent in Louisiana. Subsequently Mr. Felton recorded his vote in the negative, as did Mr. Morrison, which made the vote a tie. Mr. Morrison, in speaking on this subject, said that he did not propose to vote for the passage of another law for Secretary Sherman to violate; that, as far as his opinion was concerned, the statutes were clear enough on this subject, and he could see no necessity for additional legislation.

The committee, finding it impossible to come to any conclusion on the subject, on Monday addressed a letter to the Secretary of the Treasury announcing this fact, and requested him to inform them of the form in which he proposed to reach the contemplated return to the specific rate. The secretary replied that on Monday next the specific rate of duty would be collected on all importations of hoop iron cut to lengths, and submitted the following form of instructions, which would be sent to collectors of customs in time to go into effect then:

TO COLLECTORS OF CUSTOMS AND OTHERS:
Schedule "E" of Title 33 of the Revised Statutes imposes upon band, hoop and scroll iron various specific rates of duty, varying according to the width and thickness of the iron.

The question whether hoop iron cut into lengths for the manufacture of hoops, and having holes punched in the end, should be classified as hoop iron or as a manufacture of iron not otherwise provided for at an ad valorem rate of 35 per cent., was considered by the department in its decision (No. 3824) of December 21, 1878, wherein it was held that on the authority of the case of *Leng against Arthur*, tried in the United States Circuit Court for the Southern District of New York, hoop iron cut into lengths and so punched should be admitted to entry at the ad valorem rate of 35 per cent.

A rehearing has been had upon the question, and the department has become satisfied that the verdict of the jury in the case

before mentioned, and the evidence upon which such verdict was based, are not sufficient to justify the decision above cited, and that the admission of such articles at the ad valorem duty is in violation of the true intent of the law.

Officers of the customs are therefore instructed that hoop iron merely cut to lengths and punched with more or less holes, is not thereby removed from the category of hoop iron; and the specific rates of duty imposed on hoop iron, in Schedule E of the revised statutes, will hereafter be collected on the article specified.

Representative Errett, of Pittsburgh, is in receipt of advices that the extension of the time by the Secretary of the Treasury for the consideration of the hoop iron question has very disastrously affected that industry, and that several mills had been compelled to suspend operations on account of the glut in the market growing out of the indecision of the department.

There has been some anxiety expressed by parties interested in cotton ties, that the action of the Secretary of the Treasury respecting hoop iron cut to lengths may also affect them. It is ascertained at the department that there are no grounds for any such fears, that the hoop iron question and that of cotton ties are entirely distinct, and have no relation whatever to each other. The department still holds to its ruling of 1868, which was as follows:

"In a case lately tried in the United States Circuit Court at New Orleans, the jury, under the instructions of the court, found that 'iron cotton ties are not the same article as hoop iron, within the meaning of the act of June 30, 1864, section 3, as has been heretofore held by this department.' In view of this result, the department revokes its former ruling, and hereafter such ties, imported *bona fide* for sale and use, as such will be classed as 'manufactures of iron not otherwise provided for,' at a duty of 35 per cent. ad valorem, under the same act." (Circular letter, July 11, 1868.)

"All such ties so imported, and in bonded warehouse at the date of the above circular, may be withdrawn at 35 per cent., but payments made in excess of that amount will not be refunded unless the parties paying have protested and appealed in due time and form." (Letter to Collector, Galveston, Texas, July 31, 1868.) And making the distinction still more clear as to hoop iron, the department ruled, when an effort was made to bring it under the cotton tie decision, that "merchandise styled 'iron hoops,' but not advanced in any manner in manufacture beyond hoop iron, and not differing from any other hoop iron imported except in being cut into lengths for the alleged express purpose of being made into and used as hoops, is liable to duty as hoop iron. The department's decision acquiescing in the decision of the United States Circuit Court at New Orleans, fixing 35 per cent. as the proper rate of duty on iron cotton ties, does not apply to the merchandise in question." (Letter to Collector, New York, Nov. 10, 1868.)

The decision of the Treasury Department, in response to the letter of the Collector of the Port of New York, respecting the classification of Bessemer bars imported for use in the manufacture of barbed iron fences, has been submitted to the Secretary of the Treasury for his approval, which will doubtless be accorded within a few days. It is intimated that the decision is to the effect that this class of Bessemer steel must be rated under the provisions of the statute providing for "steel in forms not otherwise provided for." This will fix the duty at 35 per cent. ad valorem.

Actual Progress of the Hudson River Tunnel.

At 12 o'clock, noon, yesterday, a shrill sound of escaping air from the "air lock" was heard, the furnace-like door swung open, and nearly a score of laborers filed out for their dinner after four hours' confinement. They looked as other men look who work in the open atmosphere, both as to health and apparel. They were dry-shod, and no more begrimed than a street sweeper or dirt cartman. A half hour later, when they re-entered for another siege of four hours, the engineer and superintendent emerged, in rubber clothing, which was worn more as a covering than as a protection from moisture, as the tunnel is perfectly dry. In all, there were 27 men inside, working by the aid of an electric light. Atmospheric pressure, 17 pounds. The headings have now advanced to a point 110 feet from the lock and 20 feet under the river. Fifty feet are already bricked, and rails will be laid in a few days for the conveyance of materials. The progress made averages about 2½ feet per day, which is equal to one circle of iron plating, but the engineer expects to advance at the rate of 5 feet per day very soon.

Mr. Brush, the engineer in charge, spoke enthusiastically of the compressed air system, regarding success as demonstrated beyond a question. The escape of air was very moderate, and at the pressure now maintained the walls of silt were held up without any other support. The bank at the headings, he remarked, stands up straight, and the soil is so dry that the laborers stand on it in making their "benches," precisely as in any ordinary embankment. No water enters, only such as is pumped in to liquefy the silt, that it may be ejected through the pipes. Nor are there any timbers or props of any kind more than a light stick to sustain the ¾-inch plating while it is being riveted. The officers in charge notice a decided change of opinion among engineers in regard to the feasibility of the undertaking, doubts seeming to have disappeared. When questioned respecting the possible difficulties after the greatest depth of the river has been reached, which is well over on the New York side, and where there are about 150 feet of rock to be encountered, Mr. Brush did not appear to have the slightest misgivings. No movement toward construction has been made as yet, only on the New Jersey shore, pending legislation at Albany, where the railroad opposition is almost as strong as when the Tunnel Company were fighting the "D. L. & W." corporation for the right of way at the original well.

Special Notices.

Trustees' Sale of the Westminster Hematite Ore Bed

In Carroll County, Maryland.
The property consists of 22 acres of land, within a short distance from the corporate limits of the City of Westminster. It contains a very large deposit of ore, has been successfully worked, and is now in condition to resume production at once. There is a switch extending from the Western Maryland Railroad directly to the Mine, and there are Railroad connections by which the Furnaces of Pennsylvania can be readily reached. Immediate possession will be given upon the purchaser complying with the terms of sale, which are, one third cash, the balance in six and twelve months, with interest to be secured to the satisfaction of the Trustees.
The sale will be at Auction to the highest bidder, on Wednesday, the 28th day of April, 1880, at one o'clock P. M., at the Court House Door, Westminster, THOMAS A. HARTON, Auctioneer.
For further particulars apply to J. B. BRINSMAN, Executor, &c., 57 Broadway, New York.

GEO. P. ROWELL & CO.

Newspaper Advertising Bureau,
10 SPRUCE ST., NEW YORK.

GEO. P. ROWELL & CO. conduct an agency for the reception of advertisements for American newspapers. The most complete establishment of the kind in the world.
Eight thousand newspapers are kept regularly on file, open to the inspection of customers.
Every advertisement is taken at the home price of the paper, without any additional charge or commission.
An advertiser, in dealing with the Agency, is saved trouble and correspondence, making one contract instead of a dozen, a hundred or a thousand.
A book of 120 pages, containing lists of best papers, largest circulations, religious, agricultural, class, political, daily and country papers, and all publications which are specially valuable to advertisers, with some information about prices, is sent to any address on receipt of ten cents.
Persons at a distance wishing to make contracts for advertising in any town, city, county, state or territory of the United States, or any portion of the Dominion of Canada, may send a concise statement of what they want, together with a copy of the ADVERTISEMENT they desire inserted, and will receive, by return mail, an estimate of the cost.
For such information and estimate there is no charge.
Orders are taken for a single paper as well as for a List; for a single dollar as readily as for a larger sum.
Geo. P. Rowell & Co. also publish the American Newspaper Directory (price \$4), in which will be found a complete list of all American Newspapers, and a Gazetteer of the towns in which they are issued.

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Bit Brace Wrench

are now ready. This tool possesses every advantage of the ordinary Bit Brace, and will also turn with rapidity Nuts and Bolts from 1/2 to 1 1/2 inches.

Q. S. BACKUS,
103 Chambers St., New York.

For Sale.

A lot of selected Second-hand Rails, suitable for relaying or for siding. For terms, apply to
JAS. W. BATCHELOR,
No. 113 Water Street,
Pittsburgh, Pa.

HAMMACHER & DELIUS,

Hamburg, Germany,

63 Alter Wall,

Solicit correspondence with American Manufacturers and Inventors in regard to representation in European countries.

Splendid Investment.

The noted Carter's Furnace Iron property, in Carter county, East Tennessee, for sale; 12,000 acres, fine timber, labor abundant and cheap, magnificent water power, one five-ton cold blast charcoal furnace; best car wheel iron, now yielding large profit. Best New York and Tennessee references. For terms, address
HUNSON CARY,
Room 32, No. 35 E. W. N. Y.,
or 8 Madison St., Memphis Tenn.

ASTONISHING POWER
IN
PUNCHING & SHEARING PRESSES.

See our illustrated advertisement on next to last page of this paper.
PEERLESS PUNCH AND SHEAR CO.,
53 Dey Street, New York City.

Machinery, Tools, Engines, &c., For Sale.
5 Slide Lathes, 12 in. to 7 ft. swing; 4 1/2 in. Bement Car Wheel Borer; 3 Column Drills; large Slotter, 16 in. stroke, 6 ft. table; Suspension Drill; lot of Steel Tools; 2-horse-power Engine; 1-horse-power Engine; 1-horse-power Loco. Boilers; 2 to 18-horse-power Upright Boilers; Vertical Engines, 4 to 12 in. diam. cyl.; Horizontal Engines, 2 to 12 in. diam. cyl.; Steam Pumps, No. 2 to 10; Pulverizers, No. 1 to 7; Syphons, all sizes; Rock Drill and Portable Engine; Hoisting Machinery.
A. G. BROOKS & WINEBRENER,
261 North Third St., Philadelphia.

Wanted.

A situation as Clerk, Porter, or in any capacity where steady employment could be secured, by a respectable and competent young man. Is thoroughly familiar with the General Hardware business, and can furnish satisfactory references.
Address
Office of The Iron Age, 83 Reade St., N. Y.

To Capitalists and others Seeking
Manufacturing Sites.

The Parnassus, Pa., Industrial Association offers liberal inducements in land and cash to parties who will locate manufacturing establishments in their town. Natural Gas, Coal and Iron Ore in immediate vicinity. Address
FARNASSUS INDUSTRIAL ASSOCIATION,
Parnassus, Westmoreland Co., Pa.

WANTED.—Consignment of small Engines and Boilers, Screw Cutting Foot and Power Lathes, and other desirable tools, at reasonable prices, on commission, by a responsible firm in New York, having a machinery store in Birmingham. Address
P. O. Box 1012, New York City.

Special Notices.

For Sale.

Five hundred acres Gas and Coke Coal on line of B. & O. R. R., Connelville Branch, 2 1/2 miles from Pittsburgh. Quality unsurpassed. The only locality where pure Youghiogheny Gas Coal and vein, but completely separate. Can be mined at less cost than elsewhere. Gas Coal seam 6 feet, Coke Coal seam 3 feet. Analysis of Coke gives 95 per cent. of Carbon, and less than 3 per cent. of ash. Will construct one to 200 ovens if desired, and have same ready to produce Coke by October 1st.

WAVERLY COAL & COKE CO.,
Pittsburgh, Pa.
or, H. C. BUGHMAN,
57 B'way New York.

WANTED.

A FIRST-CLASS TRAVELING SALESMAN; only one who can influence a large Railroad and Foundry and Machine Shop trade, west of New York, desired. A permanent position and good salary to the right man. Give us an idea of your ability, and address
METALS,
Care of Letter Carrier No. 28,
St. Louis, Mo.

To Iron Manufacturers

The Rolling and Puddling Mills of the Hudson River Iron Co., on the Hudson River, in Poughkeepsie, will be sold at the Court House in the city of Poughkeepsie, on the 17th day of April next. This property, with 35 acres of land, five large Tenant Houses, two good Docks, and large river front and valuable Mills, which cost, five years since, \$300,000, will be sold on that day. This is well worth the attention of iron manufacturers, as the location on the river and railroad renders the property very valuable, and the sale is absolute. Inquire of
W. S. JOHNSTON,
Poughkeepsie, N. Y.

NEW ILLUSTRATED CATALOGUE,
1880.

Machinists' Tools, Foot Lathes, Chucks, Drills, Gear Cutting Attachment for Lathes, Tyson Vase Engine, Small Motor for running light machinery, Sewing Machines, &c.
JACKSON & TYLER,
Baltimore, Md.

For Sale.

Stock of Hardware, Stoves, Implements, Tinners' Tools and Stock, in South Western Iowa.
Address
Y,
Office of The Iron Age, 83 Reade St., New York.

Wanted.

50 Horse Engine.
New or Second-hand, Corliss, Brown or Buckeye make. Also Planer, 55 ft. long, with 12 ft. bed. STILES & PARKER PRESS CO.,
Middletown, Conn.

FOR SALE.

A stock of General Hardware, in one of the best towns in Central Ohio; one of the best grain markets in the state. Stock about \$8000. Address
W. R. R.,
Office of The Iron Age, 83 Reade St., New York.

For Sale.

Large Slotter, 16 in. stroke, 6 ft. table, adjustable stroke, cross and end feed and circular feed; weight about 3 tons, double column, good order; price low. Car Wheel Borer, Bement's, 48 in. table, 20 in. x 10 ft. Wood, Light & Co. Lathes, 2-ton chain Blocks, double length chain.
A. G. BROOKS & WINEBRENER,
261 N. 3d St., Phila., Pa.

BLOWING ENGINE FOR SALE.

Air Cylinder, 4 ft. x 4 ft.; Steam Cylinder above. Address
CAMDEN IRON WORKS,
Camden, N. J.

FOR SALE, CHEAP.

One Horizontal Engine, about 14-horse power, nearly new; with Tubular Boiler, Blower, Hot Well, Steam Pump and everything complete. For particulars, apply to
L. B. CURTIS,
Red Hook, N. Y.

WANTED,

A Large Facing and Boring Mill.

Address
LOCK BOX D,
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DESIGNED AND BUILT TO ORDER.

Improvements made. Ideas worked out. Foreign orders a specialty.

Richards & Dole,
Springfield, Mass.

FOR SALE, CHEAP.

A Second-Hand 5-horse-power Portable Engine and Boiler (Economizer), built by Porter Mfg. Co., Syracuse, N. Y.; nearly new and in perfect order. For particulars, call on or address
THE RENZ HARDWARE CO.,
Bridgeport, Conn.

FOR SALE.

A works completely equipped for the manufacture of Carriage Axles. Is well located in relation to coal and iron, also very accessible to market. Address
E. P. BULLARD,
14 Dey St., New York.

Special Notices.

COMMISSIONER'S SALE.

J. H. HILLMAN,
THOS. T. HILLMAN, and
GEO. S. WARTON,
Committee for
DANIEL HILLMAN.

By virtue of a judgment rendered in the above-named cause, at the February term, 1880, of the Trigg Circuit Court (for the settlement of partnership), I will, on MONDAY, the 18th day of May, 1880 (being County Court day), at the front door of the Court House in Cadiz, Ky., sell to the highest bidder the Tennessee Rolling Mill and lands attached, situated on the Cumberland River, in Lyon County, Ky., and 10 miles from Eddyville and Elizabethtown and Paducah Railroad. The mill consists of the following machinery: one Flat Mill, 66 x 26; two High Rolls, driven by 20 x 20 Engine; one Steam Hammer, 10-ton; 4-ton and 4-foot stroke; one Plate and Sheet Mill, 76 x 22; one 16-inch Bar Mill, train complete; one 6-inch Bar and Rod Mill; one 8-inch Bar and Hoop Mill; nine Puddling Furnaces; thirteen Knocking Fires; fifteen Boilers; twelve Engines, large and small; Buck Trades, Burden Squeezers, &c.; one Run-out Furnace; seven Heating Furnaces; two Annealing Furnaces; seven pair Shears; one Steam Saw; one Testing Machine; Railroad Tracks and Scales; full sets of all tools needed; Storehouse, Office, Warehouse, Dwelling and many workmen's houses, with 600 acres of land, about 600 acres of which are in cultivation.

I will also, at the same time and place, sell the Trigg Furnace, situated about three miles from the Cumberland River, in Lyon County, Ky., in Trigg County, Ky. Said furnace is first class; built in 1872; Charcoal Furnace, 48 feet high, 12 feet bush; sixty-pipe Davis Hot Blast; four Boilers; Horizontal Engine, 6 feet stroke, 20 inch diameter; furnace arranged for Cold or Hot Blast, and makes first-class iron; Storehouse, Office, Dwelling, and all necessary workmen's houses, &c., and about 450 acres of land, with about 400 acres in cultivation.

The sold on the following terms: If Rolling Mill and lands are sold together, a credit of one, two, three and four years will be given. Trigg Furnace and lands on same terms. If the machinery should be sold separate from the lands, the terms for it will be one-third cash, balance in bonds, with good and approved security, bearing interest at the rate of 6 per cent. per annum from date paid, and a lien retained on the property for the purchase money.

J. H. Hillman, at Tennessee Rolling Mill, will take pleasure in showing the property to any one desiring to look at same.
CADIZ, KY., March 4, 1880.

THOMAS H. GRINTER,
Special Commissioner.

FOR SALE.

The Salisbury Iron Manufacturing Co., of Virginia, situated nine miles from Fincastle, in Botetourt County, Virginia. There are on the property at the Furnace, several Houses, a Storehouse, Grind Mill, Blacksmith Shop, Stables, &c., all of which are owned by the property. The Furnace is in good order, having in the shed close to the furnace 20,000 bushels of Charcoal and 300 cords of Oak Wood cut and stacked in cords on the property. The Ore Bed is four miles from the Furnace, and opened about 200 feet in the face of the mountain. Water is taken a mile on the side of the mountain in a furnace, and falls down on the earth on the top of the ore bed, the mud and water passing through a creek into the James River. The ore in the bed is shoveled into a trough, or flume, with ripple bars, and a stream of the mountain water let in; before it reaches the bottom it is washed clean. Iron, acknowledged as good as the Salisbury for car wheels, has been made here for eight years, and sold for car wheels to different parties around New York, but principally to A. Whitney & Sons, of Philadelphia, and Bouton & Co., of Chicago.

The property, besides having water communication with Lynchburg and Lexington, will have within a few months, communication with the Chesapeake & Ohio R. R. at Clifton Forge, the railroad now being made from Buchanan to Clifton Forge, and runs along the James River, but within half a mile of the ore bed. The property owns 3000 acres of land, 2000 of which can be and is partly used for farming, the other 1000 acres is covered with large oak timber. Timber land can be had for a few dollars per acre, or the wood at a nominal price. The late Jacob Dakin was the Manager and half owner of the property. Since his death, in 1877, it has remained idle. If accepted as security for cash, no money for years will be required. It is offered for sale at a sacrifice by
EUGENE KELLY,
45 Exchange Place, New York,
or by COL. PENDLETON,
of Buchanan, Va.

NEW YORK, March 22, 1880.

A. J. STEINMAN, Chairman. W. R. MIDDLETON, Supt.
W. G. MENDENHALL, Sec'y & Treas.

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PENN IRON COMPANY, Limited,

MANUFACTURERS OF

Merchant Bar Iron, Hammered and

Rolled Axles, Car Forgings, Bridge

Work, Fish Joints, Bolts, R. R.

Spikes, Bolt Ends, &c., &c.,

LANCASTER, PA.

WANTED.

A Shear for splitting old rails lengthwise, with knives from 24 to 30 inches long. Address
PENN IRON CO., LIMITED,
Lancaster, Penn.

THREE-FOUR FOUNDRY AND TWO BLACK-

smith's Cranes for sale, low. R. FRAZIER, Agent, Bordentown, N. J.

BOILERS—A HORIZONTAL AND TWO UPRIGHT

Second-hand Boilers for sale, very low. Also a 7 H. Engine. R. FRAZIER, Agent, Bordentown, N. J.

TRUGG-BOLT, GRAZER-WHEEL, AND PUMP PAT

terns for sale, at less than one-fourth cost. R. FRAZIER, Agent, Bordentown, N. J.

IRON SAFE FOR SALE IN GOOD CONDITION.

Price \$30. R. FRAZIER, Agent, Bordentown, N. J.

TRUSTEES' SALE OF VALUABLE IRON PROPER-

TY.—FOUR THOUSAND ACRES OF VALUABLE LAND—FOR SALE to a mortgage executed by James Woods, H. C. Yost and James Woods, registered in the Register's Office of Stewart Co., Tennessee, in book 24, pages 410 to 436, inclusive, the undersigned will sell on the premises for cash, on the 30th day of March, 1880, that very valuable iron property located in Stewart County, Tennessee, known as Cumberland Iron Works. Parties wishing full and complete information please address the undersigned, care of Third National Bank, Nashville, Tenn.

TEMPLE O. HARRIS, Trustee.

V. L. KIRKMAN, Trustee.

SITUATION WANTED.—By a Mechanical En-

gineer who has had upward of 25 years' experience as Machinist, Draughtsman, Foreman and Superintendent of the making of Machinery of almost every kind. Is thoroughly acquainted with Blast Furnace Machinery and fixtures, Rolling Mill, Nail Factory, and Bolt and Spike Works, in all their details, including the designing and erecting the works, also Mining Machinery of all kinds and the repairing of all the leading donkey pumps made. Best of references given. Address
MECHANICAL ENGINEER,
Office of The Iron Age, 83 Reade St., New York.

Trade Report.

Office of The Iron Age,
WEDNESDAY EVENING, April 14, 1880.

The financial markets have been moderately active during the past week. The Treasury bought \$1,500,000 bonds for the sinking fund this afternoon. The amount offered was \$4,945,250.

The importations of specie and bullion for the week ending April 9 amount to \$195,048, including \$46,855 gold and \$148,193 silver. Since the 1st of January the importations will reach \$2,839,792, consisting of \$1,309,152 gold, \$1,529,621 silver and \$1019 brass and copper coin. From the 1st of August, 1879, to April 9, 1880, there has been a total importation of \$80,847,143, of which \$76,448,754 is gold and \$4,397,373 silver.

The ruling rate for call loans in the money market has been 6 per cent. Some loans were made as high as 6 per cent. in addition to a commission of one-eighth of one per cent. per annum, and some as low as 4 per cent. per annum.

United States bonds have been strong and active for the 4 per cents. Railroad bonds have been dull, the largest decline being in the Iron Mountain, Kansas and Texas, and Erie issues.

In the early portion of the week the stock market was alternately strong and heavy, but it weakened in the latter part of the week and prices declined, the decline being led by Iron Mountain, Wabash and Pacific, Kansas and Texas, Pacific Mail and Canada Southern. On the announcement that the Treasury had bought \$1,500,000 bonds for the sinking fund, the market became firm and there was a fractional advance. At the close, however, the market was barely steady. The principal dealings were in Erie, Lake Shore, Wabash and Pacific, the coal stocks and Iron Mountain.

The bank return shows a gain of \$202,450 in reserve, which now stands at \$107,450 below, against \$6,233,375 above at this time last year, and \$13,071,350 at the corresponding period in 1878. The loans show a loss this week of \$2,168,600, the specie is down \$1,645,700, the legal tenders are increased \$1,088,400, the deposits other than United States are down \$3,039,000, and the circulation is increased \$6309.

The following is an analysis of the bank totals of this week compared with that of last week:

	April 3.	April 10.	Comparisons.
Loans.....	\$290,639,500	\$288,470,900	Dec. \$2,168,600
Specie.....	33,669,300	32,023,600	Dec. 1,645,700
Legal Tenders.....	10,847,500	11,935,900	Inc. 1,088,400
Deposits.....	64,516,800	63,959,500	Dec. 557,300
Total.....	299,300,800	295,429,900	Dec. 3,039,000
Reserve re-			
quired.....	64,826,700	64,066,950	Dec. 759,750
in hand.....	300,000	107,450	Inc. 200,450
Circulation.....	30,981,600	30,987,900	Inc. 6,300

The foreign trade movements at the port of New York since our last issue are shown in the following tables:

For the week ended April 10:

	1878.	1879.	1880.
Dry goods.....	\$1,472,814	\$1,819,898	\$2,571,346
General mde.....	2,943,499	4,176,995	6,356,733
Total for week.....	\$4,416,304	\$5,996,893	\$8,928,079
Prev. reported.....	\$7,765,134	\$7,714,458	\$12,170,402

Since Jan. 1..... \$79,179,438 \$83,211,251 \$134,108,481

Included in the imports were items of merchandise valued as follows:

	Quantity.	Value.
Brass goods.....	29	\$4,443
Bronzes.....	19	5,895
Chains and anchors.....	31	1,501
Copper.....	105,109	61,109
Cutlery.....	32,416	32,416
Gas fixtures.....	1	399
Guns.....	274	48,859
Hardware.....	3	397
Iron, hoop, rods.....	109,170	5,321
Iron, sheet, tons.....	124	6,899
Iron, ore, tons.....	403	2,795
Lead, pigs.....	347,560	347,560
Lead, sheet.....	15,359	15,359
Metal goods.....	143	15,031
Nails.....	11	256
Needles.....	23	11,366
Nickel.....	8	2,376
Old metal.....	5	1,584
Platina.....	5	20,030
Plated ware.....	3	170
Percussion caps.....	10	2,132
Saddlery.....	10	919
Steel.....	13,312	90,480
Spelter.....	442,141	21,764
Silverware.....	3	118
Tin, bars.....	47,512	315,233
Tin, sheet, slabs; lbs.....	1,271,848	283,708
Wire.....	2,490	31,689
Zinc.....	166,459	9,266

For the week ended April 13:

	1878.	1879.	1880.
For the week.....	\$5,496,993	\$5,060,298	\$7,545,332
Prev. reported.....	88,453,525	78,847,378	\$5,086,534

Since Jan. 1..... \$4,950,518 \$84,807,676 \$92,631,866

For week ended April 10:

	1878.	1879.	1880.
Total for the week.....	\$77,054	\$95,050	\$107,050
Previously reported.....			

Total since January..... \$3,036,110

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. 6 1/2 1880 registered.....	103 1/2	104 1/2
U. S. 6 1/2 1880 coupon.....	103 1/2	104 1/2
U. S. 6 1/2 1881 registered.....	103 1/2	104 1/2
U. S. 6 1/2 1881 coupon.....	103 1/2	104 1/2
U. S. 6 1/2 1882 registered.....	103 1/2	104 1/2
U. S. 6 1/2 1882 coupon.....	103 1/2	104 1/2
U. S. 4 1/2 1881 registered.....	108 1/2	109
U. S. 4 1/2 1881 coupon.....	108 1/2	109
U. S. 4 1/2 1882 registered.....	107 1/2	108 1/2
U. S. 4 1/2 1882 coupon.....	107 1/2	108 1/2
U. S. Currency 6 1/2 1883.....	125	—
U. S. Currency 6 1/2 1884.....	125	—
U. S. Currency 6 1/2 1885.....	125	—
U. S. Currency 6 1/2 1886.....	125	—
U. S. Currency 6 1/2 1887.....	125	—

The following were the closing quotations of active shares:

	Bid.	Asked.
American District Telegraph.....	73 1/2	75 1/2
Atlantic and Pacific Telegraph.....	42 1/2	44 1/2
Boston Water Power.....	24	25
Burlington and Quincy.....	71 1/2	73 1/2
Canada Southern.....	59 1/2	61 1/2

Central Arizona.....	
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been a serious drawback all winter, will there is reason to believe, soon be removed. A largely increased trade in nearly all kinds of Pittsburgh manufactures is confidently expected within the next week or two. The reduction in the Iron card will, it is believed, have a tendency to stimulate other branches of business.

CR. C. G. & Co. Bar iron, bds., 300 belina S. Cases, 21	Rails, 2442 Rods, coils, 237 Steel rail ends, tons, 220
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Blooms.—The market is very quiet, and buyers are indifferent, although sellers have reduced their figures, per ton of 2464 lbs., as follows: Cold-blast Charcoal Blooms, \$55.50; run-out Anthracite, \$77.50; Sunken Lap Blooms, \$70; Northern Ore Blooms,

aters, rollers, &c., brought about by the change in the card, might lead to trouble, but nothing of the kind has been developed yet, nor is there any reason to be apprehensive, as the members of the Amalgamated Iron Association—which organization controls the labor issue in the West—say they will manfully accept the situation, notwithstanding the change makes a very serious reduction in their pay.

Scrap.—The market for Scrap Iron, in sympathy with Pig, is also somewhat demoralized, and prices are weak and nominal. o. 1 Wrought Scrap, \$38 @ \$40, net; Old Car Wheels, \$47 @ \$48, gross; Old Car Springs, \$45 @ \$46, net; do. Car Axles, \$48 @ \$49, net.

conservative, as the members of the Amalgamated Iron Association—which organization controls the labor issue in the West—say they will manfully accept the situation, notwithstanding the change makes a very serious reduction in their pay.

The weather has been much more favorable for general business, as it has dried up the roads, and the mud embargo, which has

Scrap.—The market for Scrap Iron, in sympathy with Pig, is also somewhat devalued, and prices are weak and nominal. o. 1 Wrought Scrap, \$38 @ \$40, net; Old Car Wheels, \$47 @ \$48, gross; Old Car Springs, \$45 @ \$46, net; do. Car Axles, \$8 @ \$50, net.

Window Glass.—There is nothing particularly new to note in regard to this inter-



est; business continues to keep up well; manufacturers are all behind with their orders, and stocks, both in first and second hands, are very meager. Prices steady, with a tendency to go still higher. Discounts unchanged at 50% on single and 60% double strength, in carload lots, and 40 and 10% on single, in a jobbing way.

Coke.—The market is weaker in sympathy with Pig Iron, and contracts can be made for future delivery at lower prices than those ruling a few weeks ago. We now quote at \$4.75 @ \$5 for immediate and \$4 @ \$4.25 for future delivery, free on cars at ovens.

Coal.—The Coal business continues in an unsatisfactory condition, owing to the fact that the down-river markets are all overstocked; 3½¢ bushel is still being paid for mining, although operators say that, in justice to themselves, they ought not to pay above 3¢.

The following revised prices of Merchant Iron in Pittsburgh reached us after the 33d page had gone to press. The quotations on that page are void:

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

Flat Bar.

1½ to 4 by ½ to 1 inch.....3.30
4 to 6 by ½ to 1 ".....3.60
6 to 8 by ½ to 1 ".....3.90
8 to 10 by ½ to 1 ".....4.20
10 to 12 by ½ to 1 ".....4.50
12 to 14 by ½ to 1 ".....4.80
14 to 16 by ½ to 1 ".....5.10
16 to 18 by ½ to 1 ".....5.40
18 to 20 by ½ to 1 ".....5.70
20 to 22 by ½ to 1 ".....6.00
22 to 24 by ½ to 1 ".....6.30
24 to 26 by ½ to 1 ".....6.60
26 to 28 by ½ to 1 ".....6.90
28 to 30 by ½ to 1 ".....7.20
30 to 32 by ½ to 1 ".....7.50
32 to 34 by ½ to 1 ".....7.80
34 to 36 by ½ to 1 ".....8.10
36 to 38 by ½ to 1 ".....8.40
38 to 40 by ½ to 1 ".....8.70
40 to 42 by ½ to 1 ".....9.00
42 to 44 by ½ to 1 ".....9.30
44 to 46 by ½ to 1 ".....9.60
46 to 48 by ½ to 1 ".....9.90
48 to 50 by ½ to 1 ".....10.20
50 to 52 by ½ to 1 ".....10.50
52 to 54 by ½ to 1 ".....10.80
54 to 56 by ½ to 1 ".....11.10
56 to 58 by ½ to 1 ".....11.40
58 to 60 by ½ to 1 ".....11.70
60 to 62 by ½ to 1 ".....12.00
62 to 64 by ½ to 1 ".....12.30
64 to 66 by ½ to 1 ".....12.60
66 to 68 by ½ to 1 ".....12.90
68 to 70 by ½ to 1 ".....13.20
70 to 72 by ½ to 1 ".....13.50
72 to 74 by ½ to 1 ".....13.80
74 to 76 by ½ to 1 ".....14.10
76 to 78 by ½ to 1 ".....14.40
78 to 80 by ½ to 1 ".....14.70
80 to 82 by ½ to 1 ".....15.00
82 to 84 by ½ to 1 ".....15.30
84 to 86 by ½ to 1 ".....15.60
86 to 88 by ½ to 1 ".....15.90
88 to 90 by ½ to 1 ".....16.20
90 to 92 by ½ to 1 ".....16.50
92 to 94 by ½ to 1 ".....16.80
94 to 96 by ½ to 1 ".....17.10
96 to 98 by ½ to 1 ".....17.40
98 to 100 by ½ to 1 ".....17.70
100 to 102 by ½ to 1 ".....18.00
102 to 104 by ½ to 1 ".....18.30
104 to 106 by ½ to 1 ".....18.60
106 to 108 by ½ to 1 ".....18.90
108 to 110 by ½ to 1 ".....19.20
110 to 112 by ½ to 1 ".....19.50
112 to 114 by ½ to 1 ".....19.80
114 to 116 by ½ to 1 ".....20.10
116 to 118 by ½ to 1 ".....20.40
118 to 120 by ½ to 1 ".....20.70
120 to 122 by ½ to 1 ".....21.00
122 to 124 by ½ to 1 ".....21.30
124 to 126 by ½ to 1 ".....21.60
126 to 128 by ½ to 1 ".....21.90
128 to 130 by ½ to 1 ".....22.20
130 to 132 by ½ to 1 ".....22.50
132 to 134 by ½ to 1 ".....22.80
134 to 136 by ½ to 1 ".....23.10
136 to 138 by ½ to 1 ".....23.40
138 to 140 by ½ to 1 ".....23.70
140 to 142 by ½ to 1 ".....24.00
142 to 144 by ½ to 1 ".....24.30
144 to 146 by ½ to 1 ".....24.60
146 to 148 by ½ to 1 ".....24.90
148 to 150 by ½ to 1 ".....25.20
150 to 152 by ½ to 1 ".....25.50
152 to 154 by ½ to 1 ".....25.80
154 to 156 by ½ to 1 ".....26.10
156 to 158 by ½ to 1 ".....26.40
158 to 160 by ½ to 1 ".....26.70
160 to 162 by ½ to 1 ".....27.00
162 to 164 by ½ to 1 ".....27.30
164 to 166 by ½ to 1 ".....27.60
166 to 168 by ½ to 1 ".....27.90
168 to 170 by ½ to 1 ".....28.20
170 to 172 by ½ to 1 ".....28.50
172 to 174 by ½ to 1 ".....28.80
174 to 176 by ½ to 1 ".....29.10
176 to 178 by ½ to 1 ".....29.40
178 to 180 by ½ to 1 ".....29.70
180 to 182 by ½ to 1 ".....30.00
182 to 184 by ½ to 1 ".....30.30
184 to 186 by ½ to 1 ".....30.60
186 to 188 by ½ to 1 ".....30.90
188 to 190 by ½ to 1 ".....31.20
190 to 192 by ½ to 1 ".....31.50
192 to 194 by ½ to 1 ".....31.80
194 to 196 by ½ to 1 ".....32.10
196 to 198 by ½ to 1 ".....32.40
198 to 200 by ½ to 1 ".....32.70
200 to 202 by ½ to 1 ".....33.00
202 to 204 by ½ to 1 ".....33.30
204 to 206 by ½ to 1 ".....33.60
206 to 208 by ½ to 1 ".....33.90
208 to 210 by ½ to 1 ".....34.20
210 to 212 by ½ to 1 ".....34.50
212 to 214 by ½ to 1 ".....34.80
214 to 216 by ½ to 1 ".....35.10
216 to 218 by ½ to 1 ".....35.40
218 to 220 by ½ to 1 ".....35.70
220 to 222 by ½ to 1 ".....36.00
222 to 224 by ½ to 1 ".....36.30
224 to 226 by ½ to 1 ".....36.60
226 to 228 by ½ to 1 ".....36.90
228 to 230 by ½ to 1 ".....37.20
230 to 232 by ½ to 1 ".....37.50
232 to 234 by ½ to 1 ".....37.80
234 to 236 by ½ to 1 ".....38.10
236 to 238 by ½ to 1 ".....38.40
238 to 240 by ½ to 1 ".....38.70
240 to 242 by ½ to 1 ".....39.00
242 to 244 by ½ to 1 ".....39.30
244 to 246 by ½ to 1 ".....39.60
246 to 248 by ½ to 1 ".....39.90
248 to 250 by ½ to 1 ".....40.20
250 to 252 by ½ to 1 ".....40.50
252 to 254 by ½ to 1 ".....40.80
254 to 256 by ½ to 1 ".....41.10
256 to 258 by ½ to 1 ".....41.40
258 to 260 by ½ to 1 ".....41.70
260 to 262 by ½ to 1 ".....42.00
262 to 264 by ½ to 1 ".....42.30
264 to 266 by ½ to 1 ".....42.60
266 to 268 by ½ to 1 ".....42.90
268 to 270 by ½ to 1 ".....43.20
270 to 272 by ½ to 1 ".....43.50
272 to 274 by ½ to 1 ".....43.80
274 to 276 by ½ to 1 ".....44.10
276 to 278 by ½ to 1 ".....44.40
278 to 280 by ½ to 1 ".....44.70
280 to 282 by ½ to 1 ".....45.00
282 to 284 by ½ to 1 ".....45.30
284 to 286 by ½ to 1 ".....45.60
286 to 288 by ½ to 1 ".....45.90
288 to 290 by ½ to 1 ".....46.20
290 to 292 by ½ to 1 ".....46.50
292 to 294 by ½ to 1 ".....46.80
294 to 296 by ½ to 1 ".....47.10
296 to 298 by ½ to 1 ".....47.40
298 to 300 by ½ to 1 ".....47.70
300 to 302 by ½ to 1 ".....48.00
302 to 304 by ½ to 1 ".....48.30
304 to 306 by ½ to 1 ".....48.60
306 to 308 by ½ to 1 ".....48.90
308 to 310 by ½ to 1 ".....49.20
310 to 312 by ½ to 1 ".....49.50
312 to 314 by ½ to 1 ".....49.80
314 to 316 by ½ to 1 ".....50.10
316 to 318 by ½ to 1 ".....50.40
318 to 320 by ½ to 1 ".....50.70
320 to 322 by ½ to 1 ".....51.00
322 to 324 by ½ to 1 ".....51.30
324 to 326 by ½ to 1 ".....51.60
326 to 328 by ½ to 1 ".....51.90
328 to 330 by ½ to 1 ".....52.20
330 to 332 by ½ to 1 ".....52.50
332 to 334 by ½ to 1 ".....52.80
334 to 336 by ½ to 1 ".....53.10
336 to 338 by ½ to 1 ".....53.40
338 to 340 by ½ to 1 ".....53.70
340 to 342 by ½ to 1 ".....54.00
342 to 344 by ½ to 1 ".....54.30
344 to 346 by ½ to 1 ".....54.60
346 to 348 by ½ to 1 ".....54.90
348 to 350 by ½ to 1 ".....55.20
350 to 352 by ½ to 1 ".....55.50
352 to 354 by ½ to 1 ".....55.80
354 to 356 by ½ to 1 ".....56.10
356 to 358 by ½ to 1 ".....56.40
358 to 360 by ½ to 1 ".....56.70
360 to 362 by ½ to 1 ".....57.00
362 to 364 by ½ to 1 ".....57.30
364 to 366 by ½ to 1 ".....57.60
366 to 368 by ½ to 1 ".....57.90
368 to 370 by ½ to 1 ".....58.20
370 to 372 by ½ to 1 ".....58.50
372 to 374 by ½ to 1 ".....58.80
374 to 376 by ½ to 1 ".....59.10
376 to 378 by ½ to 1 ".....59.40
378 to 380 by ½ to 1 ".....59.70
380 to 382 by ½ to 1 ".....60.00
382 to 384 by ½ to 1 ".....60.30
384 to 386 by ½ to 1 ".....60.60
386 to 388 by ½ to 1 ".....60.90
388 to 390 by ½ to 1 ".....61.20
390 to 392 by ½ to 1 ".....61.50
392 to 394 by ½ to 1 ".....61.80
394 to 396 by ½ to 1 ".....62.10
396 to 398 by ½ to 1 ".....62.40
398 to 400 by ½ to 1 ".....62.70
400 to 402 by ½ to 1 ".....63.00
402 to 404 by ½ to 1 ".....63.30
404 to 406 by ½ to 1 ".....63.60
406 to 408 by ½ to 1 ".....63.90
408 to 410 by ½ to 1 ".....64.20
410 to 412 by ½ to 1 ".....64.50
412 to 414 by ½ to 1 ".....64.80
414 to 416 by ½ to 1 ".....65.10
416 to 418 by ½ to 1 ".....65.40
418 to 420 by ½ to 1 ".....65.70
420 to 422 by ½ to 1 ".....66.00
422 to 424 by ½ to 1 ".....66.30
424 to 426 by ½ to 1 ".....66.60
426 to 428 by ½ to 1 ".....66.90
428 to 430 by ½ to 1 ".....67.20
430 to 432 by ½ to 1 ".....67.50
432 to 434 by ½ to 1 ".....67.80
434 to 436 by ½ to 1 ".....68.10
436 to 438 by ½ to 1 ".....68.40
438 to 440 by ½ to 1 ".....68.70
440 to 442 by ½ to 1 ".....69.00
442 to 444 by ½ to 1 ".....69.30
444 to 446 by ½ to 1 ".....69.60
446 to 448 by ½ to 1 ".....69.90
448 to 450 by ½ to 1 ".....70.20
450 to 452 by ½ to 1 ".....70.50
452 to 454 by ½ to 1 ".....70.80
454 to 456 by ½ to 1 ".....71.10
456 to 458 by ½ to 1 ".....71.40
458 to 460 by ½ to 1 ".....71.70
460 to 462 by ½ to 1 ".....72.00
462 to 464 by ½ to 1 ".....72.30
464 to 466 by ½ to 1 ".....72.60
466 to 468 by ½ to 1 ".....72.90
468 to 470 by ½ to 1 ".....73.20
470 to 472 by ½ to 1 ".....73.50
472 to 474 by ½ to 1 ".....73.80
474 to 476 by ½ to 1 ".....74.10
476 to 478 by ½ to 1 ".....74.40
478 to 480 by ½ to 1 ".....74.70
480 to 482 by ½ to 1 ".....75.00
482 to 484 by ½ to 1 ".....75.30
484 to 486 by ½ to 1 ".....75.60
486 to 488 by ½ to 1 ".....75.90
488 to 490 by ½ to 1 ".....76.20
490 to 492 by ½ to 1 ".....76.50
492 to 494 by ½ to 1 ".....76.80
494 to 496 by ½ to 1 ".....77.10
496 to 498 by ½ to 1 ".....77.40
498 to 500 by ½ to 1 ".....77.70
500 to 502 by ½ to 1 ".....78.00
502 to 504 by ½ to 1 ".....78.30
504 to 506 by ½ to 1 ".....78.60
506 to 508 by ½ to 1 ".....78.90
508 to 510 by ½ to 1 ".....79.20
510 to 512 by ½ to 1 ".....79.50
512 to 514 by ½ to 1 ".....79.80
514 to 516 by ½ to 1 ".....80.10
516 to 518 by ½ to 1 ".....80.40
518 to 520 by ½ to 1 ".....80.70
520 to 522 by ½ to 1 ".....81.00
522 to 524 by ½ to 1 ".....81.30
524 to 526 by ½ to 1 ".....81.60
526 to 528 by ½ to 1 ".....81.90
528 to 530 by ½ to 1 ".....82.20
530 to 532 by ½ to 1 ".....82.50
532 to 534 by ½ to 1 ".....82.80
534 to 536 by ½ to 1 ".....83.10
536 to 538 by ½ to 1 ".....83.40
538 to 540 by ½ to 1 ".....83.70
540 to 542 by ½ to 1 ".....84.00
542 to 544 by ½ to 1 ".....84.30
544 to 546 by ½ to 1 ".....84.60
546 to 548 by ½ to 1 ".....84.90
548 to 550 by ½ to 1 ".....85.20
550 to 552 by ½ to 1 ".....85.50
552 to 554 by ½ to 1 ".....85.80
554 to 556 by ½ to 1 ".....86.10
556 to 558 by ½ to 1 ".....86.40
558 to 560 by ½ to 1 ".....86.70
560 to 562 by ½ to 1 ".....87.00
562 to 564 by ½ to 1 ".....87.30
564 to 566 by ½ to 1 ".....87.60
566 to 568 by ½ to 1 ".....87.90
568 to 570 by ½ to 1 ".....88.20
570 to 572 by ½ to 1 ".....88.50
572 to 574 by ½ to 1 ".....88.80
574 to 576 by ½ to 1 ".....89.10
576 to 578 by ½ to 1 ".....89.40
578 to 580 by ½ to 1 ".....89.70
580 to 582 by ½ to 1 ".....90.00
582 to 584 by ½ to 1 ".....90.30
584 to 586 by ½ to 1 ".....90.60
586 to 588 by ½ to 1 ".....90.90
588 to 590 by ½ to 1 ".....91.20
590 to 592 by ½ to 1 ".....91.50
592 to 594 by ½ to 1 ".....91.80
594 to 596 by ½ to 1 ".....92.10
596 to 598 by ½ to 1 ".....92.40
598 to 600 by ½ to 1 ".....92.70
600 to 602 by ½ to 1 ".....93.00
602 to 604 by ½ to 1 ".....93.30
604 to 606 by ½ to 1 ".....93.60
606 to 608 by ½ to 1 ".....93.90
608 to 610 by ½ to 1 ".....94.20
610 to 612 by ½ to 1 ".....94.50
612 to 614 by ½ to 1 ".....94.80
614 to 616 by ½ to 1 ".....95.10
616 to 618 by ½ to 1 ".....95.40
618 to 620 by ½ to 1 ".....95.70
620 to 622 by ½ to 1 ".....96.00
622 to 624 by ½ to 1 ".....96.30
624 to 626 by ½ to 1 ".....96.60
626 to 628 by ½ to 1 ".....96.90
628 to 630 by ½ to 1 ".....97.20
630 to 632 by ½ to 1 ".....97.50
632 to 634 by ½ to 1 ".....97.80
634 to 636 by ½ to 1 ".....98.10
636 to 638 by ½ to 1 ".....98.40
638 to 640 by ½ to 1 ".....98.70
640 to 642 by ½ to 1 ".....99.00
642 to 644 by ½ to 1 ".....99.30
644 to 646 by ½ to 1 ".....99.60
646 to 648 by ½ to 1 ".....99.90
648 to 650 by ½ to 1 ".....100.20
650 to 652 by ½ to 1 ".....100.50
652 to 654 by ½ to 1 ".....100.80
654 to 656 by ½ to 1 ".....101.10
656 to 658 by ½ to 1 ".....101.40
658 to 660 by ½ to 1 ".....101.70
660 to 662 by ½ to 1 ".....102.00
662 to 664 by ½ to 1 ".....102.30
664 to 666 by ½ to 1 ".....102.60
666 to 668 by ½ to 1 ".....102.90
668 to 670 by ½ to 1 ".....103.20
670 to 672 by ½ to 1 ".....103.50
672 to 674 by ½ to 1 ".....103.80
674 to 676 by ½ to 1 ".....104.10
676 to 678 by ½ to 1 ".....104.40
678 to 680 by ½ to 1 ".....104.70
680 to 682 by ½ to 1 ".....105.00
682 to 684 by ½ to 1 ".....105.30
684 to 686 by ½ to 1 ".....105.60
686 to 688 by ½ to 1 ".....105.90
688 to 690 by ½ to 1 ".....106.20
690 to 692 by ½ to 1 ".....106.50
692 to 694 by ½ to 1 ".....106.80
694 to 696 by ½ to 1 ".....107.10
696 to 698 by ½ to 1 ".....107.40
698 to 700 by ½ to 1 ".....107.70
700 to 702 by ½ to 1 ".....108.00
702 to 704 by ½ to 1 ".....108.30
704 to 706 by ½ to 1 ".....108.60
706 to 708 by ½ to 1 ".....108.90
708 to 710 by ½ to 1 ".....109.20
710 to 712 by ½ to 1 ".....109.50
712 to 714 by ½ to 1 ".....109.80
714 to 716 by ½ to 1 ".....110.10
716 to 718 by ½ to 1 ".....110.40
718 to 720 by ½ to 1 ".....110.70
720 to 722 by ½ to 1 ".....111.00
722 to 724 by ½ to 1 ".....111.30
724 to 726 by ½ to 1 ".....111.60
726 to 728 by ½ to 1 ".....111.90
728 to 730 by ½ to 1 ".....112.20
730 to 732 by ½ to 1 ".....112.50
732 to 734 by ½ to 1 ".....112.80
734 to 736 by ½ to 1 ".....113.10
736 to 738 by ½ to 1 ".....113.40
738 to 740 by ½ to 1 ".....113.70
740 to 742 by ½ to 1 ".....114.00
742 to 744 by ½ to 1 ".....114.30
744 to 746 by ½ to 1 ".....114.60
746 to 748 by ½ to 1 ".....114.90
748 to 750 by ½ to 1 ".....115.20
750 to 752 by ½ to 1 ".....115.50
752 to 754 by ½ to 1 ".....115.80
754 to 756 by ½ to 1 ".....116.10
756 to 758 by ½ to 1 ".....116.40
758 to 760 by ½ to 1 ".....116.70
760 to 762 by ½ to 1 ".....117.00
762 to 764 by ½ to 1 ".....117.30
764 to 766 by ½ to 1 ".....117.60
766 to 768 by ½ to 1 ".....117.90
768 to 770 by ½ to 1 ".....118.20
770 to 772 by ½ to 1 ".....118.50
772 to 774 by ½ to 1 ".....118.80
774 to 776 by ½ to 1 ".....119.10
776 to 778 by ½ to 1 ".....119.40
778 to 780 by ½ to 1 ".....119.70
780 to 782 by ½ to 1 ".....120.00
782 to 784 by ½ to 1 ".....120.30
784 to 786 by ½ to 1 ".....120.60
786 to 788 by ½ to 1 ".....120.90
788 to 790 by ½ to 1 ".....121.20
790 to 792 by ½ to 1 ".....121.50
792 to 794 by ½ to 1 ".....121.80
794 to 796 by ½ to 1 ".....122.10
796 to 798 by ½ to 1 ".....122.40
798 to 800 by ½ to 1 ".....122.70
800 to 802 by ½ to 1 ".....123.00
802 to 804 by ½ to 1 ".....123.30
804 to 806 by ½ to 1 ".....123.60
806 to 808 by ½ to 1 ".....123.90
808 to 810 by ½ to 1 ".....124.20
810 to 812 by ½ to 1 ".....124.50
812 to 814 by ½ to 1 ".....124.80
814 to 816 by ½ to 1 ".....125.10
816 to 818 by ½ to 1 ".....125.40
818 to 820 by ½ to 1 ".....125.70
820 to 822 by ½ to 1 ".....126.00
822 to 824 by ½ to 1 ".....126.30
824 to 826 by ½ to 1 ".....126.60
826 to 828 by ½ to 1 ".....126.90
828 to 830 by ½ to 1 ".....127.20
830 to 832 by ½ to 1 ".....127.50
832 to 834 by ½ to 1 ".....127.80
834 to 836 by ½ to 1 ".....128.10
836 to 838 by ½ to 1 ".....128.40
838 to 840 by ½ to 1 ".....128.70
840 to 842 by ½ to 1 ".....129.00
842 to 844 by ½ to 1 ".....129.30
844 to 846 by ½ to 1 ".....129.60
846 to 848 by ½ to 1 ".....129.90
848 to 850 by ½ to 1 ".....130.20
850 to 852 by ½ to 1 ".....130.50
852 to 854 by ½ to 1 ".....130.80
854 to 856 by ½ to 1 ".....131.10
856 to 858 by ½ to 1 ".....131.40
858 to 860 by ½ to 1 ".....131.70
860 to 862 by ½ to 1 ".....132.00
862 to 864 by ½ to 1 ".....132.30
864 to 866 by ½ to 1 ".....132.60
866 to 868 by ½ to 1 ".....132.90
868 to 870 by ½ to 1 ".....133.20
870 to 872 by ½ to 1 ".....133.50
872 to 874 by ½ to 1 ".....133.80
874 to 876 by ½ to 1 ".....134.10
876 to 878 by ½ to 1 ".....134.40
878 to 880 by ½ to 1 ".....134.70
880 to 882 by ½ to 1 ".....135.00
882 to 884 by ½ to 1 ".....135.30
884 to 886 by ½ to 1 ".....135.60
886 to 888 by ½ to 1 ".....135.90
888 to 890 by ½ to 1 ".....136.20
890 to 892 by ½ to 1 ".....136.50
892 to 894 by ½ to 1 ".....136.80
894 to 896 by ½ to 1 ".....137.10
896 to 898 by ½ to 1 ".....137.40
898 to 900 by ½ to 1 ".....137.70
900 to 902 by ½ to 1 ".....138.00
902 to 904 by ½ to 1 ".....138.30
904 to 906 by ½ to 1 ".....138.60
906 to 908 by ½ to 1 ".....138.90
908 to 910 by ½ to 1 ".....139.20
910 to 912 by ½ to 1 ".....139.50
912 to 914 by ½ to 1 ".....139.80
914 to 916 by ½ to 1 ".....140.10
916 to 918 by ½ to 1 ".....140.40
918 to 920 by ½ to 1 ".....140.70
920 to 922 by ½ to 1 ".....141.00
922 to 924 by ½ to 1 ".....141.30
924 to 926 by ½ to 1 ".....141.60
926 to 928 by ½ to 1 ".....141.90
928 to 930 by ½ to 1 ".....142.20
930 to 932 by ½ to 1 ".....142.50
932 to 934 by ½ to 1 ".....142.80
934 to 936 by ½ to 1 ".....143.10
936 to 938 by ½ to 1 ".....143.40
938 to 940 by ½ to 1 ".....143.70
940 to 942 by ½ to 1 ".....144.00
942 to 944 by ½ to 1 ".....144.30
944 to 946 by ½ to 1 ".....144.60
946 to 948 by ½ to 1 ".....144.90
948 to 950 by ½ to 1 ".....145.20
950 to 952 by ½ to 1 ".....145.50
952 to 954 by ½ to 1 ".....145.80
954 to 956 by ½ to 1 ".....146.10
956 to 958 by ½ to 1 ".....146.40
958 to 960 by ½ to 1 ".....146.70
960 to 962 by ½ to 1 ".....147.00
962 to 964 by ½ to 1 ".....147.30
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966 to 968 by ½ to 1 ".....147.90
968 to 970 by ½ to 1 ".....148.20
970 to 972 by ½ to 1 ".....148.50
972 to 974 by ½ to 1 ".....148.80
974 to 976 by ½ to 1 ".....149.10
976 to 978 by ½ to 1 ".....149.40
978 to 980 by ½ to 1 ".....149.70
980 to 982 by ½ to 1 ".....150.00
982 to 984 by ½ to 1 ".....150.30
984 to 986 by ½ to 1 ".....150.60
986 to 988 by ½ to 1 ".....150.90
988 to 990 by ½ to 1 ".....151.20
990 to 992 by ½ to 1 ".....151.50
992 to 994 by ½ to 1 ".....151.80
994 to 996 by ½ to 1 ".....152.10
996 to 998 by ½ to 1 ".....152.40
998 to 1000 by ½ to 1 ".....152.70
1000 to 1002 by ½ to 1 ".....153.00
1002 to 1004 by ½ to 1 ".....153.30
1004 to 1006 by ½ to 1 ".....153.60
1006 to 1008 by ½ to 1 ".....153.90
1008 to 1010 by ½ to 1 ".....154.20
1010 to 1012 by ½ to 1 ".....154.50
1012

PATENT DECISION.

Hardware dealers will please take notice of the decree of Judge Lowell, of the United States Circuit Court, in the case of Millers Falls Company against Quimby S. Backus, for infringement of Bit Brace Patents, which decree was in favor of the Millers Falls Company. The full text of the opinion may be found on page 11 of *The Iron Age*, of date December 18, 1879.

We have now obtained three separate decrees against three different manufacturers, and shall continue to prosecute all infringers. When the manufacturers are able to pay the damages we shall in no case trouble dealers, but when manufacturers are unable to pay we must ask the dealers to remunerate us, else responsible makers might combine with irresponsible makers to render worthless the most valuable patents. Any reasonable man can see the point, and we have before given all dealers sufficient notice.

MILLERS FALLS CO.,
74 Chambers street, New York.

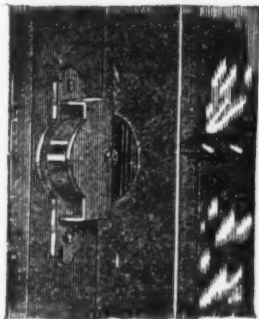
PATENT

ANTI-WINDOW

RATTLER,

FOR

Dwellings, Cars, Steamboats, &c.



The Anti-Window Rattler supplies a long needed want; it is so simple in construction that it can be used on any window, and so complete that it will prevent the slightest shaking, no matter how great the jar or how old the sash. As shown in cut, it consists of a rubber wheel in a nickel-plated or brass frame; is ornamental as well as useful, and does not interfere with raising or lowering the sash.

HEATON & DENCKLA, General Agents, 307 Commerce St., Philadelphia.
GRAHAM & HAINES, Agents, 113 Chambers St., New York.
OTIS D. DANA, Agent, 26 to 32 Pearl St., Boston, Mass.

F. HABERMAN,

MANUFACTURER OF

Stamped, Japanned and Plain

TINWARE,

AND THE CHEAPEST AND BEST

OIL AND GAS STOVES
IN THE MARKET.

NOTE.—These Stoves are made under license from the Kerosene Lamp Heater Co., the royalties are paid by me, and the Stoves have license tags attached, so that dealers may purchase and sell them with perfect safety.

SEND FOR CIRCULARS.

294 PEARL STREET, NEW YORK.

LANE'S MEASURING FAUCET.
Price, \$3.00.

For Light or Heavy Molasses, Oils, Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any Measuring Faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw flies. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

MANUFACTURED EXCLUSIVELY BY
LANE BROS., Millbrook, N. Y.

General Agency, GRAHAM & HAINES, 113 Chambers St., New York.



Bemis & Call Hardware & Tool Co.



PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.

Philadelphia "STAR" Bolt Works.

NORWAY IRON

FANCY HEAD BOLTS,

Carriage & Tire Bolts.

Star Axle Clips, &c.

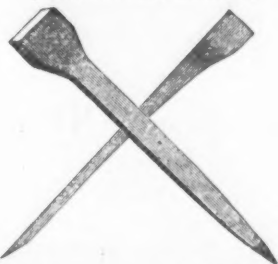
TOWNSEND, WILSON & HUBBARD, 2301 Cherry St. Philadelphia, Pa.

NATIONAL
Horse Nail Co.

MANUFACTURERS OF

FINISHED

(BRIGHT OR BLUED)



These nails are made of the best brands of NORWAY IRON, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,

VERGENNES, VT.

DURRIE & McCARTY, Agents,
No. 97 Chambers St., New YorkThe Oldest Shot Tower in America.
FOUNDED JULY 4, 1808.THOMAS W. SPARKS,
Manufacturer of
SPARKS'American Chilled Shot,
Rivalling the English and all Others.
STANDARD DROP & BUCK SHOT
AND BAR LEAD.

121 Walnut Street, Philadelphia.

St. Louis Malleable Iron
Company,
2116 MARKET STREET,
ST. LOUIS, MO.

HENRY M. FILLEY, President. JOHN D. FILLEY, Secretary.

MANUFACTURERS OF

Malleable and Gray
Iron Castings,
GENERAL HARDWARE, &c.W. G. FOSSICK,
Engineer and Iron Agent,
86 Cannon St., London, England.Iron and Steel Rails,
Bars, Angles, Plates,
Pig Iron & Puddled Bars.Old Rails, Scrap Iron, Steel Rail Ends
c. f. i. American, or f. o. b. European ports.
Contracts negotiated on the most favorable terms.
Bankers: Barnetts, Hoares & Co., London.RIEHLÉ BROS.
STANDARD
SCALES
AND
TESTING
MACHINES

Patent "Self-Adjusting" Railroad Track Scales, pronounced "the most accurate and durable" over all competitors at World's Fair, 1876. In use by Pennsylvania, Lehigh Valley, Baltimore and Ohio, and other Railroads. Patent Coal and Hay Scales. Warehouse and Platform Scales and Scales for all purposes. Machines for testing materials, all sizes.

Works, 9th st., at Master; Store, 52 4th st., Philadelphia. New York Office 91 Liberty Street.

"DRAW CUT"
BUTCHERS' MACHINES.
Choppers, Hand and Power
Stuffers.
Lard Presses,
and the Best in Use.
MURRAY IRON WORKS,
Burlington, Iowa.

R. C. PURVIS,
Manufacturer of
Octagon
Tea Pots.
Rear of 407 Cherry St., Philadelphia, Pa.
Send for Price List.

Established in 1839.

Formerly L. & A. G. Co.

L. COES & CO.

Manufacturers of L. Coes'

GENUINE IMPROVED AND MECHANICS

Patent Screw Wrenches

UNDER PATENTS DATED

JUNE 26, 1866,
MARCH 23, 1869,
REISSUED 1870.NOVEMBER 10, 1863,
FEBRUARY 23, 1864,
REISSUED JUNE 1, 1869,
IMPROVED AUG. 1, 1877.The back thrust when in use borne by the SHANK instead of the Hand's
None genuine unless stamped "L. COES & CO."

WORCESTER, MASS.

Warehouse, 97 Chambers St., & 81 Beade St., N. Y.
DURRIE & McCARTY, Sole Agents.

The 1880 Pennsylvania Lawn Mower

OUTSTRIPS ALL COMPETITORS.

LIGHT DRAFT AND EASILY ADJUSTED.

Every Machine Warranted to Work as Represented.

Points Claimed as being Meritorious:

Lightness combined with Strength in construction.
It runs more easily.
It will cut longer grass.
It is more durable.
It requires less repairs.
It cuts the grass more smoothly.
The attractive appearance of the machine.
It is the lightest machine in use, and all that is necessary to satisfy our customers of its superiority is to place it in competition with any other machine in the town in which they may reside.

PRICE LIST.

Width of Cutter.	Style.	Power required.	Weight.	Price.
10 inch.	A Child.	3 1/2 lbs.	30	\$14.00
12 "	A Lad.	3 1/2 "	36	"
14 "	A Lady.	36 "	40	"
16 "	One Man Size.	38 "	48	"
18 "	"	41 "	52	"

NEW MACHINES.

For Cutting Long Grass

15 inch, 10 1/2 inch Driving Wheels, 6 1/2 inch
Cylinder, Man Size, 48 lbs. \$23.00
17 inch, 10 1/2 inch Driving Wheels, 6 1/2 inch
Cylinder, Man Size, 51 lbs. 25.00

For Sale By

LOYD, SUPPLEE & WALTON, Philadelphia.
DURRIE & McCARTY, New York.
AMES PLOW CO., Boston, Mass.
PRATT & CO., Buffalo, N. Y.
SIMMONS HARDWARE CO., St. Louis, Mo.
HAMILTON & MATHEWS, Rochester, N. Y.
MARKLY, ALLING & CO., Chicago, Ill.

DUCHARME, FLETCHER & CO., Detroit, Mich.
LOCKWOOD, VANDORF & MILLER, Cleveland, O.
KRUSE & BAHLMAN, Cincinnati, O.
PRATT & CO., Elmira, N. Y.
LOYD & CLARKE, La Crosse, Wis.
SMITH & SCRIBNER, Minneapolis, Minn.
HART & CO., Louisville, Ky.

THE NEW

"CHARTER OAK"
LAWN MOWER.

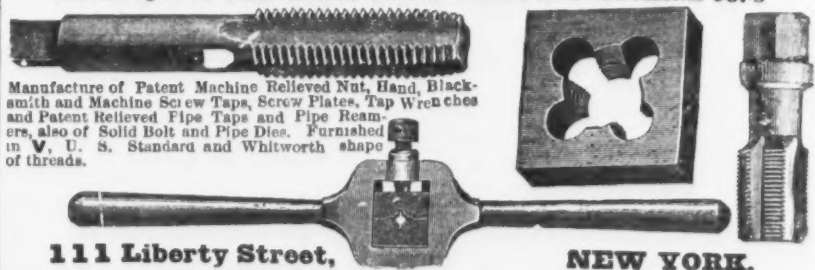
The most beautiful and perfect Lawn Mower in the world. It stands to-day at the head of the list of Lawn Mowers in the United States and Europe. It is mounted on two large driving wheels or pulleys, and instead of being on the outside of the frames, to run in the uncultivated grass, they are placed inside the frames, back of the cutting blades, running on a shaft, each independent of the other, allowing the machine to be turned either to the right or the left without injury to the soil, and to be turned around in a circle no greater than its own length, and cutting at the same time. Those desiring a perfect Lawn Mower will find the "CHARTER OAK" far superior to any other. It is more durable, easier to adjust, operate and keep in order, and the driving wheels being inside the frames, enables the operator to cut the grass clean around walks, drives, flower-beds, trees and shrubbery.

Manufactured in Five Sizes.

8-inch, 10-inch, 12-inch, 15-inch (standard), 18-inch.

H. S. MANNING & CO.,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S



Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers, also of Solid Bolt and Pipe Dies. Furnished in V. U. S. Standard and Whitworth shape of threads.

111 Liberty Street,

NEW YORK.

HUNTER'S Rotary SIFTERS.

Mixer, Scoop, Measure, Weigher, Egg Beater, Rice Washer, Tomato, Pumpkin, Starch, Wine and Fruit Strainer.
The greatest combination known, and pronounced by press and public the only first-class sifter in the world. Made better, of better stock, sifts much faster, and saves more material than all other sifters. Made in two sizes: No. 1, 3 p's. No. 2, 5 p's. Liberal discount to the trade. Please mention this paper, and send for illustrated Price List.
J. M. HUNTER & CO., Sole Manufacturers and Owners,
38 W. Fourth St., Cincinnati, Ohio.

HOOPES & MERRY,

Manufacturers of

"LION" Brand or B. B. "PHENIX" Brand or Best Charcoal

GALVANIZED SHEET IRON,

539, 541, 543, 545 and 547 West Fifteenth Street, New York.
Corrugated Sheet Iron, Black or Galvanized. All kinds of Ironwork, Tinned or Galvanized.

MARTIN'S ENGLISH HORSE CLIPPERS.

J. J. Shannon,
1707 Market St.,
PHILADELPHIA.
Recommended as the best Hand Clipper made.
\$3.25 EACH.
Extra pieces for sale.
Send for circular.

themselves right in the minds of those chiefly concerned—namely, the American, foreign, and colonial consumers."

AT SHEFFIELD

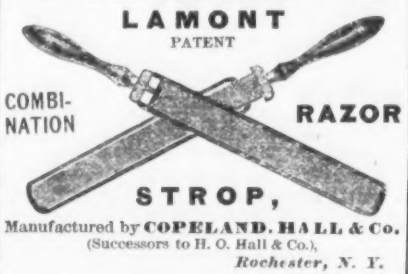
the electioneering craze is in full cry and the holidays are having full scope; but there is, nevertheless, a fair amount of work in hand, and there are many firms who report themselves well supplied with orders. In the heavy trades this is very marked, almost all the leading firms being busy in every department. The rail mills are being run double shifts in some quarters, and the Bessemer departments proper find ample employment in rolling for cutlery and general hardware purposes. The cast steel houses are very satisfactorily engaged. At William Jessop & Sons' meeting of shareholders the other day, it was stated that the stock was valued at £400,000, and that the company's prospects are good. They have now as many orders as they can deal with, or (as Mr. Thomas Jessop said) "perhaps more." Mr. Jessop expressed himself confident as to the future of the concern, and humorously mentioned his liking for the old place by saying he was "allowed to go to business on melting days." At Brown, Bayley & Dixon's meeting of shareholders, the small results of last year's operations were attributed to the falling off of the Russian demand; but it was stated that the company's works are now well engaged and that prospects are good, mainly owing to the successful cultivation of a more general trade. The cutlery firms are irregularly active, some houses having more work than they can well get through and others but indifferent occupation. The best concerns are busy. George Wostenholms, for instance, still having a difficulty in obtaining a sufficient number of workmen. A writer who professes to have official information, from Dr. Webster, the United States Consul at Sheffield, gives the following particulars of local trade with the United States: "In January, 1879, the total value of exports to the States was £36,747, which included: Steel, £11,361; cutlery, £17,376; edge-tools, £722; sheep shears, £1242. In January, 1880, the exports had increased to 80,572, including: Steel, £20,080; Bessemer rails, £29,000; cutlery, £17,099; edge-tools, £639; sheep shears, £1100. Comparing the second months of the two years, the figures work out thus: February, 1879—Steel, £12,177; cutlery, £13,343; edge-tools, £520; sheep shears, £895, the total being £33,939. In February, 1880, the total was £68,849, more than double, though less than in January, owing to the exceptional weight of rails exported to the States during the first month of the year. During last February the value of steel exported to the States was £28,407, and of cutlery, £18,996; rails had fallen to £4885, edge-tools to £862, and sheep shears remained almost stationary at £1078."

STAFFORDSHIRE AND BIRMINGHAM.

In these parts the ironmasters are indisposed to enlarge their engagements at present, owing to the uncertainty induced by the close of the quarter and the possibility of a rise in prices at the quarterly meetings. In respect of bars there is not a great amount of business doing in the open market, where the underselling of merchants places actual producers at a disadvantage. Best bars are steadily held at £9 per ton, but common and medium sorts are to be had at all prices, between £7 and £8. 10/. With so much ordinary iron on offer best kinds are somewhat discounted, but as they are made by wealthy houses, "list" rates have not so far suffered any change in a downward direction, nor is it likely that such will be the case in view of the wages difficulty and the chance of a strike of the workmen in case the masters do not properly, as the men think, act up to the provisions of the sliding scale arrangement. Plates are selling well at £10 @ £10. 10/ per ton, mostly for boiler repairing purposes, a class of work which is largely carried out at all manufacturing during holiday intervals. Sheets for the use of hardware manufacturers are moving off freely at £10 @ £11, while the same iron for galvanizing purposes fetches £10. 10/ @ £11; latens, £13 @ £14, and doubles £12 @ £12. 10/. For the United States a steady call is experienced for hoops, which move off in bulk at £9 @ £10 per ton. Messrs. Miller & Son, of Monmore Green, near Wolverhampton, are making 15 to 20 tons of cotton ties weekly to the order of Mr. J. J. McComb, of New York and Liverpool. From Monmore Green these ties are sent by canal to Preston Brook, where they are fastened to the baling hoops, the whole being then tarred and shipped to New York, Norfolk, Va., &c. Each ton of the ties is said to need about 15 tons of hoops, so that of the completed articles the weekly quantity must aggregate between 250 and 300 tons, a somewhat large total. In the miscellaneous hardware industries the Black Country generally is not fully engaged, although there are many houses which have cleared their surplus stocks very materially of late, and have therefore less hesitation than formerly in allowing the production to keep up with or even slightly exceed the requirements of actual orders. From Australia the indents are of fair size, but recent mail advices from one or two of those colonies speak of the unemployed population in terms which do not augur well for the immediate future of our hardware trade with them. South Africa proves a good and steady buyer, and India is also a recipient of many capital lines of general hardware. The Continent is here and there a good buyer, especially Turkey and the reconstituted countries along the Danube. From Brazil and the West Indies excellent orders for tools and hardware have recently come to hand—indeed the former empire is sending better favors than for a long time past.

SOUTH WALES AND MONMOUTHSHIRE appear to be pretty well employed on the whole, a considerable proportion of the finished output being on account of United States orders. At Landore another blast furnace has been blown in, making about 500 tons weekly of Bessemer Nos. 1 and 2. Another furnace is about to be restarted at the same works, where there are now 85 coke ovens at work. The steel departments are likewise busy. At Cyfarthfa the furnaces and mills are running steadily, with a finished output of over 1200 tons of iron

rails, bars, &c., weekly. At Newport, shipments are heavy. Two steamers are loading rails for Australia and will take nearly 3000 tons in all. Two steamers are loading rails for India, and others have been chartered for Natal and Brazil. A French vessel is loading rails for Corinto, in the North Pacific. Rails, spiegel and pig are being sent to the United States. One vessel, the Plymouth, is to convey 2000 tons from Ebbw Vale to New York, and four Norwegian ships are loading general iron for the same port. To your ports freights are now lower, ranging from 13/ to 13/6 for New York, Philadelphia, or Baltimore. The importations of iron ore, mostly from Spain, into Cardiff and Newport are exceedingly heavy.



Manufactured by COPELAND, HALL & CO. (Successors to H. O. Hall & Co.) Rochester, N. Y.



Bar and screw of cast steel, with two extra cutter heads. Manufactured and for sale by the L. B. FLANDERS MACHINE WORKS, 1025 Hamilton St., Philadelphia, Pa.

BUFFALO SCALE CO., BUFFALO, N. Y., Manufacturers of H. R. Track Scales, Hay Scales, Coal Scales, Grain Scales, Platform Scales, Counter Scales, &c. Send for price list, stating what you want.

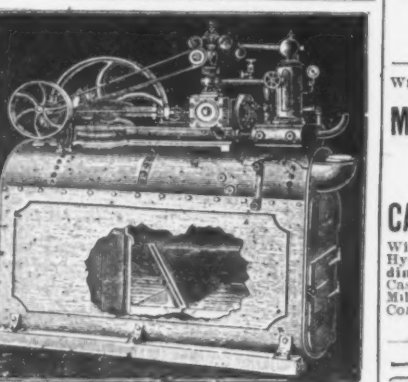
MINERS' CANDLES. Superior to any other Light for Mining Purposes. Manufactured by **JAMES BOYD'S SON,** Nos. 10 & 12 Franklin St., New York.

P. W. GALLAUDET, Banker and Note Broker, Nos. 3 and 5 Wall Street, NEW YORK. HARDWARE, METAL, IRON RUBBER, SHOE, PAPER AND PAPER-HANGINGS, LUMBER, COAL AND RAILROAD PAPER WANTED. ADVANCES MADE ON BUSINESS PAPER AND OTHER SECURITIES.

Keystone Screw Co., 17th and Venango Streets, PHILADELPHIA. **J. BILLERBECK,** Manufacturer of Iron Gimlet-Pointed Wood Screws

W. R. OSTRANDER, Manufacturer of PATENT Speaking Tube Whistles. Bell Hangers' Hardware. Send for revised catalogue. 19 Ann Street, New York.

BARBER'S PATENT COUNTERSINK. Diploma awarded at Mechanics' Fair, Boston, 1878. Hole bored any depth, and countersink for any size screw at one operation. \$2 per doz.; discount in quantity. Sample by mail 50 cts. D. F. BARBER, 1321 Washington St., Boston.



Return Fine Boiler, large Fire Box, no sparks. Do not fail to send for circular to **SKINNER & WOOD, Erie, Pa.**

BROWNING, SISUM & CO., 85 Chambers St., Manufacture Belt Hooks, Cutters, Spring Keys, D Rings, Staples, and everything pertaining to wire binding. Factory, BROOKLYN.

SUPERIOR QUALITY North Carolina MICA. We are prepared to furnish Stove Manufacturers, Oil Stove Manufacturers, Jobbers and Retail Dealers, WITH **MICA** of very best quality. Estimates furnished on application. **J. S. & M. PECKHAM,** Utica, N. Y., Miners and Wholesale Dealers in Mica.

Enterprise Mfg. Co. OF CINCINNATI. Thos. C. White & Co., Manufacturers of **BUILDERS' HARDWARE,** Locks, Latches, Hinges and Bronze and Brass Goods of all kinds. **JAIL LOCKS.** Liberal Discount to the Trade. Office & Factory, No. 50 Central Ave., Cincinnati, Ohio.

CLARK'S RUBBER WHEELS. This wheel is the best now in the market, and is attracting the attention of large manufacturers on account of the great saving of floor, which is ten times greater than the extra cost of this wheel. Adapted to all purposes, viz., Warehouse trucks, platform trucks, scales, boxes, baskets and heavy casters. For full particulars see the first issue of The Iron Age next month, or address **GEO. P. CLARK, Windsor Locks, Conn.**

Lemon Squeezer. A New and Important Invention. The operation is by a presser lever, standard link-supporting ring, guide rods, a cup, convex bed perforated. The lemon is cut in half, and the edges are spread out when pressed; this insures uniformity of pressure, breaking the cells of the lemon and extracting all the juice. A box of lemons can be squeezed in twenty minutes. **ROBERT UNDERDONK, Sole Manufacturer, 405 Grand St., New York.**

SOMETHING NEW! PULLIAM'S PATENT BOLSTER SPRINGS FOR FARM WAGONS. This valuable device is suited to wagons of any size—made of the best steel and warranted—attached by four bolts through the bed—can be put on by any person. They remain on the wagon for all uses and work equally well whether with empty or loaded wagon. There is no use for a spring seat—makes a comfortable spring wagon out of a farm wagon—and save largely in wear and tear. We want Agents every where. Send for description and prices, and mention this paper. **TEMPLE & BIRGE MFG. CO., St. Louis, Mo. S. L. ALLEN & CO., Philadelphia, Pa., Agents.**

PEERLESS Dampor Regulator. Superior in every respect to all other regulators. The greatest fuel-saving appliance ever invented. Insures safety from explosion. In ordering mention steam pressure. Illustrated Catalogue sent on application. We set it up and guarantee performance. Price \$75.00.

AMERICAN STEAM APPLIANCE CO., Sole Manufacturers, 13 and 15 Park Row, New York. **WILLIAM H. AINEY, Chairman. PETER D. WANNER, Sec. and Treas.** **Mellert Foundry & Machine Co., Limited,** (Works Established at Reading, Pa., in 1848.) Manufacturers of **CAST IRON WATER AND GAS PIPE,** With special Castings, Flange Pipe, Water Gates, Fire Hydrants, Lamp Posts, &c. The Improved Canadian Turbine Water Wheel, Machinery and Castings of every description for Furnaces, Rolling Mills, Grist and Saw Mills, Mining Pumps, Hoists, &c. Columns, Brackets, Iron Railings, &c. **ARNOLD MELLERT, Supt., Reading, Pa.**

DEARBORN'S Pat. Adjustable Blind Awning Fixtures. These goods are now well established in the market, having been in use for three years. For Price List of Feb. 15, 1880, and full particulars, discounts, &c., address **Boston Blower Co., Sole Manufacturers, Boston, Mass.**

Greenfield Tool Co., Greenfield, Mass. **PATENT CONCAVE OX SHOES.** The only forged Ox Shoe made with concavity to fit hoof, and the best and cheapest. Also, Flat Shoes with two calks at same price. **PRESSED STEEL GEARING.** Most powerful, accurate, durable and cheapest. Any shaped teeth. **J. COMLY, Patentee, LINCOLN PARK, N. J.**

BRADSTREET'S

A SEMI-WEEKLY JOURNAL

DEVOTED TO

Trade, Commerce, and Finance.

This journal covers a ground the extent of which is occupied by no other publication, and forms an invaluable work of reference to the merchant and manufacturer.

REGULAR AND RELIABLE CORRESPONDENCE, furnished by experts expressly for this journal, from all the principal trade centres of this country is embraced in its columns.

THE CONDITION AND PROSPECTS of the various markets are carefully recorded, and the possibilities and opportunities for trade are demonstrated as by no other medium extant.

QUESTIONS OF COMMERCIAL INTEREST and importance are fully and ably discussed editorially, without prejudice, by some of the most responsible writers and statisticians of the times.

THE BUSINESS CHANGES occurring in the United States and Canada—such as failures, dissolutions of partnerships, chattel mortgages, etc., etc.—are printed in each issue, and the list is more complete and comprehensive than can be obtained through any other source.

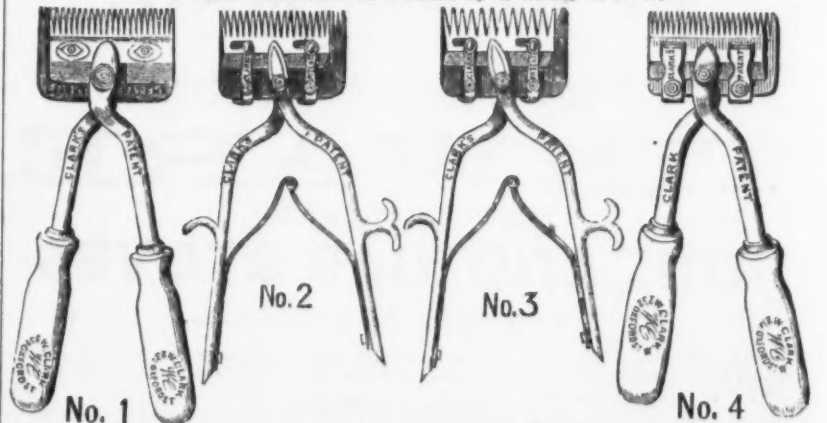
THE CIRCULATION of this journal being among the best merchants, manufacturers and banking institutions of not only this country but many foreign, it presents an excellent advertising opportunity to a limited number of first-class banks, corporations and business firms who wish to keep their names before the commercial world.

Published by THE BRADSTREET CO., 279, 281, 283 BROADWAY, NEW YORK.

Twelve Dollars per year.

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Prize Medal Awarded, Paris, 1878.



No. 1.—This well-known instrument has now been before the public for many years, and has given universal satisfaction, and is everywhere acknowledged to be by far the best, and therefore the cheapest in the market. Nos. 2 and 3 have also met with great success. No. 2.—ONE-HANDED CLIPPER, for heads, manes, quarters and difficult parts, leaving one hand at liberty to hold the horse, thus enabling the clipping to be performed by one man only. No. 3.—Same as No. 2, but with coarser teeth, for legs and bellies, and coarse hair, which would break the finer teeth. Avoiding the necessity of getting under the animal, and the consequent liability of accident to the man and also to the machine itself. No. 4.—A TWO-HANDED INSTRUMENT, with the patent grasshopper springs over the plates. This improvement renders the machine simply perfect, producing a softness and ease of motion not to be surpassed, while by the peculiar and continuous self-acting pressure of the spring the two plates are kept in cutting contact, and the machine requires no further adjustment whatever. These springs are also applied to Nos. 2 and 3. No. 4.—No stable should be without this set of incomparable instruments. See that all these machines are fully stamped in strict accordance with the above illustrations—none others being genuine. To be obtained wholesale of Messrs. McCoy & Co., 134 Duane St., and Messrs. Roseman Bros., 128 Chambers St., both of New York, and all merchants in the United States; and retail, of all Saddlery, Ironmongers and Cutlery in the world, and of the Patentee, W. Clark, 232 Oxford St., London.

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Patented Oct. 29, 1878.

The Simplest, Cheapest and Best Ice Breaker ever offered to the Public.

Manufactured and Sold By

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Send for circulars.

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R. D. WYNN,

Windsor, Vt., U. S. A.,

Sole manufacturer of the above Screw. Indorsed by builders, railroad and mining men as the best screw jack in the market. Also manufactures Press Screws, Lard and Wine Presses, Tackle Blocks, &c. Circulars and prices, address as above. (Please say The Iron Age.)

Agents: Pugsley & Chapman, 8 Liberty St., New York. Sam'l May & Co., 16, 18 & 20 Oliver St., Boston.

PATENT CONCAVE OX SHOES. The only forged Ox Shoe made with concavity to fit hoof, and the best and cheapest. Also, Flat Shoes with two calks at same price. **Greenfield Tool Co.,** Greenfield, Mass.

PRESSED STEEL GEARING. Most powerful, accurate, durable and cheapest. Any shaped teeth. **J. COMLY, Patentee, LINCOLN PARK, N. J.**

JAMES, AIKMAN & CO.'S PATENT IMPROVED METALLIC EXCELSIOR REFRIGERATOR

Manufactured by
JAMES, AIKMAN & CO.,
No. 25 Cliff Street, New York.

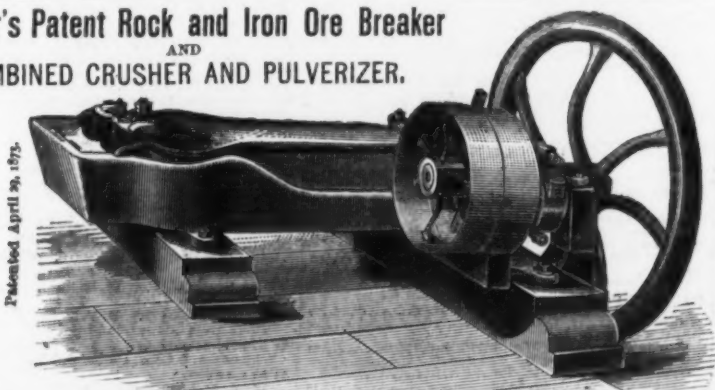
For Sale by W. W. Montague & Co., San Francisco, Cal.; Wm. Blair & Co., Cincinnati.



It is made of galvanized iron, circular in form, set on casters, wastes no room, and is light and easily moved. The outside is painted in imitation of oak. The interior is arranged with rotary adjustable shelves, which can be regulated at pleasure. The double cylinder forming an air-tight chamber, in connection with the arrangement of the ice-chamber and the ventilator, makes the action of the Refrigerator perfect, and all the parts are so arranged as to be easily kept clean and sweet. The provision chamber, being under and separate from the ice-box, is free from ascending vapors. It is the only Refrigerator that imparts no taste or smell to its contents. It contains a water-cooler, furnishing ice-water without additional expense.

No.	Diameter.	Height.	Price.	No.	Diameter.	Height.	Price.
20	21 inches.	34 inches.	\$17 00	24	25 inches.	39 inches.	\$26 00
22	23 "	36 "	21 50	27	28 "	41 "	34 00

Forster's Patent Rock and Iron Ore Breaker AND COMBINED CRUSHER AND PULVERIZER.



The Blake Crusher Patent has expired. After six years of practical and constant use at the Etna Iron and Nail Works, Bridgeport, Ohio, to which Company all desiring information are respectfully referred, the Forster Crusher has demonstrated its superiority. It requires but one-third the power to run it. It requires less than one-half the expense to keep it in repair. It is the simplest machine ever made to accomplish the same amount of work. The saving in expense of keeping in repair will pay for it in one year, besides saving all the annoyance and expense of delays. It will break rocks or iron ore to any required size, and can be so adjusted as to pulverize to any required fineness. Its capacity with three inch belt is thirty tons iron ore in ten hours. Larger machines in proportion. Every machine guaranteed as to efficiency, material and workmanship. We furnish of any required size—large or small. Its lightness and efficiency make it very desirable for gold and silver mining, all the parts being easily transported. We annex the testimony of a well known and thoroughly practical rolling mill manager:

Messrs. TOTTEN & CO.—DEAR SIR: I have been operating constantly in connection with our works for nearly six years, one of Forster's Crushers, manufactured by you, for crushing ore, used in our puddling furnaces. I have a thorough practical acquaintance with the Crusher in general use, and have no hesitation in saying that the Forster Crusher will crush ore with one-third the power of the Blake Crusher, and with one-half the expense of keeping in repair. The dies can be so adjusted as to pulverize. I take pleasure in saying, after using it six years, that it is the simplest, most economical and most efficient Crusher I ever saw.

LEWIS JONES, Manager Etna Iron and Nail Co.
All communications addressed to us will receive prompt attention.

TOTTEN & CO., Rolling Mill and Heavy Machinery Founders, Pittsburgh, Pa.

BLACK AND TINNED IRON RIVETS.

8 oz. 1 lb. 1 1/4 lb. 1 1/2 lb. 2 lb. 4 lb. 6 lb. 7 lb. 8 lb.

CURVE HEAD. TRUSS HEAD. CONE HEAD. ROUND HEAD. COUNTERSUNK HEAD. STEEPLE HEAD. GIRE HEAD. RAME RIVET. FLAT HEAD. COUNTERSUNK OVAL HEAD. MACHINE HEAD. TIRE BLANK.

W. P. TOWNSEND & CO.,
PITTSBURGH PA.,
Manufacturers of every description of First Quality
RIVETS.

Torrey's Door Springs.
P. R. DUNNE,
Manufacturer,
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Torrey's Patent
COG WHEEL
Ice Cream
Freezers.
Torrey's Door Springs.
P. R. DUNNE, Manufacturer,
152 Fulton St., Cor. Church, NEW YORK.

[See advertisement in The Iron Age of April 1, 1880.]
WHEELER & MELICK CO.,
ALBANY, NEW YORK, U. S. A.,
Manufacturers of
IMPROVED FARM IMPLEMENTS
AND MACHINERY.
RHODE ISLAND HORSE SHOE CO.,
MANUFACTURERS OF
Horse, Mule & Snow Shoes of the Perkins Pattern.
Works at Valley Falls, R. I., and Buffalo, N. Y. Office, 31 Exchange Place, Providence, R. I.
F. W. CARPENTER, President. C. H. PERKINS, Gen'l Manager. R. W. COMSTOCK, Secretary.

CROSS CUT SAWS.

Caution to Manufacturers of, Dealers in, and Users of Cross-Cut Saws and One-Man Cross Cuts:

Dealers in and Manufacturers of Saws, and Hardware Dealers generally, are hereby notified that the undersigned are the owners of the reissued Patent for Saw Handles, No. 8996, Nov. 18, 1879, original patent, Jan. 18, 1870.

Every Cross-Cut Saw having a handle, part of which, adapted to one hand, is above the blade, and part, adapted to the other hand, opposite the end of the blade, is an infringement of the said patent, and prompt legal proceedings will be taken against manufacturers of and dealers in saws provided with such handles.



The following is the claim on which we rely:
"In a cross cut saw, the combination of the saw-blade with a handle, part of which, adapted to one hand, is above the said blade, and part, adapted to the other hand, directly opposite the end of the said blade, all substantially as set forth."

HENRY DISSTON & SONS,

KEYSTONE SAW WORKS, Philadelphia, Feb. 17, 1880.

HOWSON & SON, Philadelphia and Washington, Attorneys for DISSTON & SONS.

COLEMAN EAGLE BOLT WORKS

ESTABLISHED 1845.

WELSH & LEA.

**NORWAY IRON CARRIAGE & TIRE BOLTS,
AXLE CLIPS, &c.**

Highest and only Awards and Medals, Philadelphia, 1876, and Paris, 1878.

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Bergen Port Spelter
MINES: Lehigh Valley, Pa. WORKS & FURNACES: Bergen Port, N. J.
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From Lehigh Ore.

Especially adapted for

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Also manufacturers of

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Superior for LIQUID PAINT on account of its body and wearing properties.

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**THE
Sprague Novelty Works,**

15, 17 & 19 North Water Street,

ROCHESTER, N. Y.,

Manufacturers of

**Hardware Specialties,
SPRAGUE'S**

"Perfection," "Combination"
and other Razor Stropps.

Refer to The Iron Age first issue of each month.



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Manufacturer of
Sprout's Double and
Single Shear

HORSE FORK,
And
Sprout's

**HAY ELEVATORS,
PULLEYS and
GRAPPLES.**

Send for Circulars.

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The Original and Genuine.

ALL OTHERS ARE IMITATIONS.

OVER 100,000 NOW IN USE.

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With Porcelain-Lined Cooler.

ACKNOWLEDGED THE ONLY COMPLETE AND SUCCESSFUL FILTER AND COOLER IN THE WORLD.

ISAAC S. WILLIAMS & Co., 728 Market Street, Philadelphia, Pa.—We have sold your "Patent Water Filter" for the last six years. Our sales in that time having reached upwards of five thousand and in no instance have we heard of any failure in performing all you claim for them.

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BUFFALO, N. Y.

STAY BOLTS

**HOOPES & TOWNSEND,
KEYSTONE
BOILER RIVETS
PHILADELPHIA.**

BRIDGE RIVETS

Delusion Rat and Mouse Trap,

Formerly manufactured by

CLAUDIUS JONES & CO.,

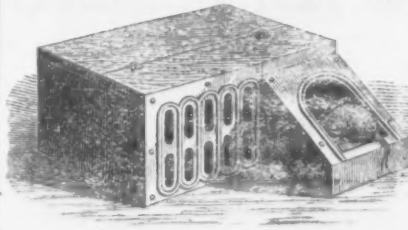
At Bridgeport, Conn.,

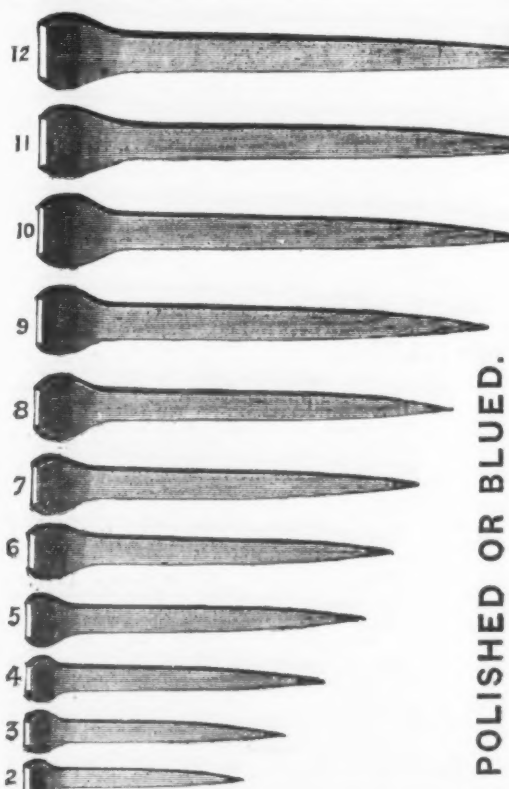
Have Removed to **ERIE, PA.**

This is the most successful Rat and Mouse

Catcher on the market.

Send for Price List.





POLISHED OR BLUED.

AUSABLE HORSE NAILS,

Twisted, Bent and Drawn COLD.

Hot Forged and Cold Hammered Pointed.

Are the only Nails in market that are made in imitation of the Hand Process. They have the uniformity of Machine Nails and the toughness of those hammered by hand. Our

HOT FORGED AND COLD HAMMERED POINTED NAILS

Are the Standard Nails,

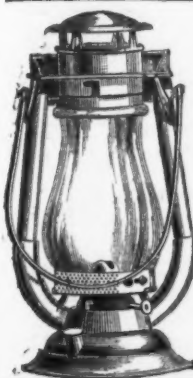
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GENERALLY THROUGHOUT THE UNITED STATES.

They also compete successfully in Foreign Countries with machine and hand-made Nails of their own manufacture.

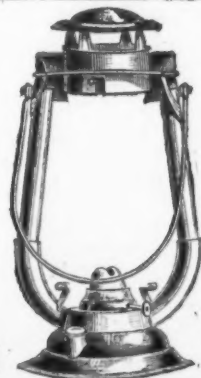
AUSABLE HORSE NAIL CO.,

4 Warren St., New York.

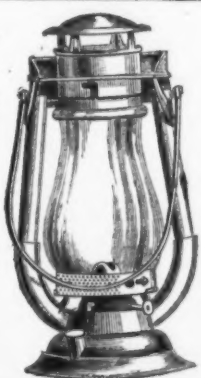


MILLER'S NO. 13 LANTERN

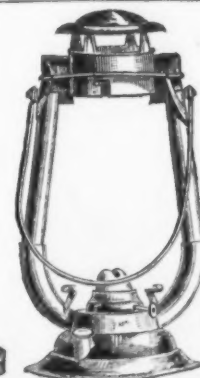
Gives more light and will hold the flame more perfectly than any other Lantern made.



For Prices and Samples, address
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Meriden, Conn.,
OR
35 Warren St.,
New York.



Manufacturers of
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Brass Kettles,
Machine Oilers,
Kerosene Goods,
Tinner's Trimmings,
&c., &c.



THE ECONOMIC PATENT BOILER FEED PUMP, I. B. DAVIS, Maker, Hartford, Conn. Send for Circular.

SOLDERING FURNACE. Price, \$8.



This improved furnace burns coal oil (kerosene) of any grade without smoke or odor, heating coppers equal to, or better than, charcoal. The fire is lighted in less time, and is as easily controlled as a lamp. Those doing piece work find this greatly to their advantage. We have letters from manufacturers who have thoroughly tested it with coppers of all sizes, saving "We get a saving of 25 per cent. over charcoal in its use." Any one ordering a furnace U. S. D. or with money inclosed, if not as represented, money, less freight, refunded. Address:
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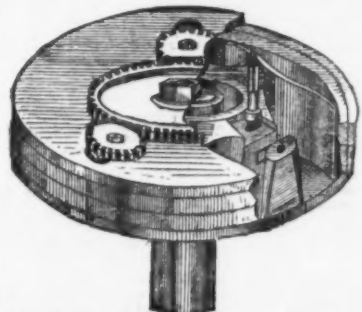
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Retail Price, \$1 per window (four balances). Liberal Discount to the Trade. Retain Medium and Light Window Sash at any point of opening, with large surplus holding power in reserve, available if required by drawing the adjusting screws. An acquaintance with the genuine merits of these goods, and their simple requirements in use will insure to them the favor of the user and dealer. A Mechanism always wanted, and as easily applied to windows as the common sash pulley, rendering the use of boxed frames, cords, pulleys, and the perplexing task of hanging sash unnecessary. Sashes are locked with a meeting rail lock, as with weights. Sample set, 4 Balances, sent postage free upon receipt of \$1. For sale by the Hardware trade. Address
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For sale by BUTLER & HUNTING,
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SASH CHAINS,
With Patent Attachments.
Warranted for years. Chains of any size made to order, and trade supplied with liberal discount.



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The rings are expanded without removing the cylinder head. Guaranteed to save ten per cent. over any now in use. Special attention given to repairing, improving, &c. Send for circular and price list.
628 and 630 Filbert St., Philadelphia.

Watchman's Improved Time Detector, with Safety Lock Attachment.

Patented 1875-6-7. Beware of imitations. This instrument is supplied with 12 keys for 12 different stations. Invaluable for all concerns employing night watchmen. Send for circulars to
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A. PARDEE & CO., 303 Walnut St., PHILADELPHIA,

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The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.

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Dealers in
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Retail Yard on D. L. & W. Railroad, cor. Grove and 10th sts., Jersey City. Coal delivered direct from mines to carts and wagons. Families and manufacturers supplied with the best qualities of Coal at the lowest rates. Offices: At yard cor. Grove and 10th sts.; cor. Bay st. and Newark av., Jersey City; Room 35, 111 Broadway, N. Y. General Office, Bank Building, cor. Newark and Hudson sts., Hoboken, N. J. P. O. Box 247, Hoboken.

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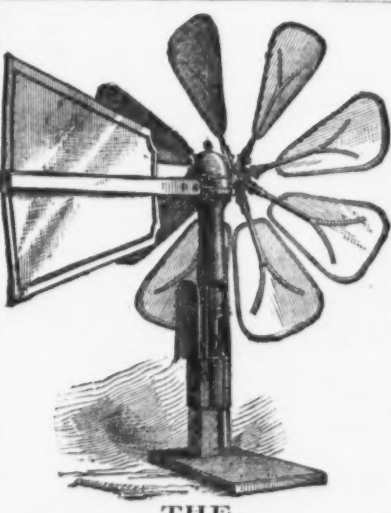


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For Scythes, Axes, Knives and Turpentine Hacks. Factories at Pike Station, N. H., and Evansville and Westmore, Vt.
Genuine Old Reliable, Indian Pond (Red End) Premium, Union, White Mountain, Arctic, Hacker, Diamond Grit, The New Bone, Lamelle, Rags, Wallingbury Lake, Green Mountain, Black Diamond, Moving Machine, German Pattern, Chocolate, Ax Bits.
Stones made, labeled and branded in any style desired. PRICE and QUALITY GUARANTEED. All the above brands are of clear, keen grit and will not glaze.

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Support and lock sashes of all kinds and sizes; are very convenient, simple and durable; are easily and quickly operated, and always sure to hold sashes in most desirable positions. Lower spring can be used in connection with a sash having weights, as a lock. For sale by most Philadelphia wholesale houses. Circulars give full instructions. Samples mailed to the Trade free.
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Water Driven to any Height and Distance by Compressed Air. Country Houses Supplied Cheaply and Certainly for Bath Rooms, Water Closets, Hot and Cold Water Faucets, &c. Plenty of Fresh Water for Stock on Farms. The best Pump for irrigating, supplying Railroad tanks, and for Mining purposes. For Circular and Price list address **EZRA BROOKS, Sec'y** and General Manager of The Hartford Compressed Air Pump Co., Hartford, Conn., U. S. A.



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Maynard's Planters', Yankee, Hilling and Bog Hoes, also Braden's, Elwell's and others. An unrivalled assortment.

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Manufacturers of
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TURKEY WING GRAIN CRADLES, 4, 5 and 6 fingers. GRAPE VINE GRAIN CRADLES, 4 fingers. SOUTHERN PATTERN GRAIN CRADLES, 4, 5 and 6 fingers. All of a superior quality. None genuine unless marked Grant Fan Mill and Cradle Co. Send for illustrated catalogue and price list. P. O. Address,
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AN ENTIRE NEW MAKE OF MINE LAMP.

THREE DIFFERENT SIZE SPOUTS. SEND 15 CENTS FOR SAMPLE TO
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SCRANTON, PA.

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SEAMLESS TUBING.

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Over 100,000 pairs already in use. Send for Circular
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BLOCK'S O.K. GRATER. BLOCK'S STRAINER.

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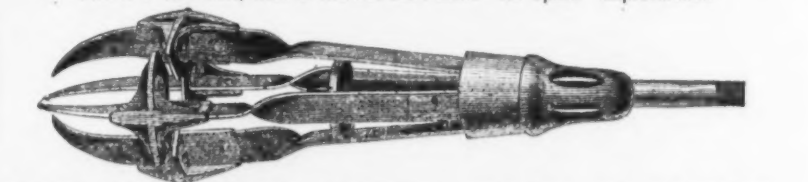
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The Patent "Air Space" Coverings for Steam Pipes, Hot-Blast Pipes, Boilers, &c.
Plastic or Hair Felt, with or without the Patent "Air Space" Improvement.



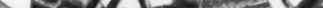
THE NATIONAL STEEL TUBE CLEANER.
Saves its cost every time it is used.
THE CHALMERS-SPENCE CO., foot 9th St., E. R., New York.

WILEY & RUSSELL MFG. CO., Greenfield, Mass.

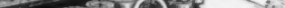
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Bolt Cutters, for Hand or Power.
Screw Plates, cutting from wire sizes to 1½ inch.
Lighting Taps, Dies and Drawers for use in the



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Tire Benders,
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Patented Nov. 14, 1876; Feb. 5, 1878.

The "ACME" is

made in one piece,
with an always



A First Class Article.

Send for Price List.

NEW YORK STAMPING CO., Sole Manufacturers,

311 and 313 Avenue A, New York.

 **Wilson Bohannan.** 




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For Railroad Switches, Freight Cars, and the Hardware Trade. All sizes, with Brass and Steel Keys, with and without chains.

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PASSENGER CAR LOCKS. Bronzed, Nickel-Plated and Japanned.

Catalogues and Samples sent upon application. **BROOKLYN, N. Y.**

CHAMPION    **BROWN'S**

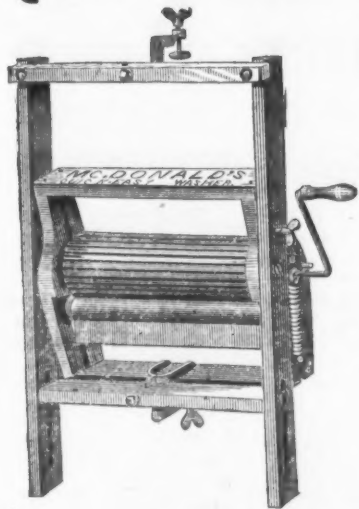
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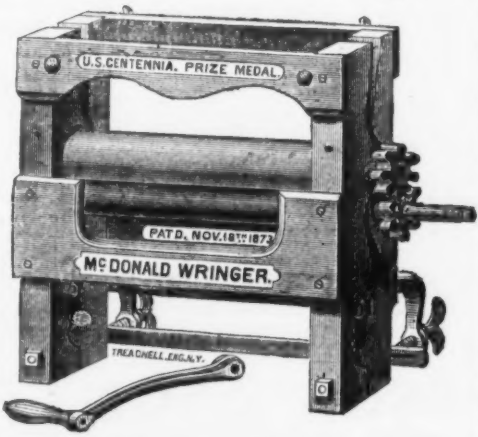
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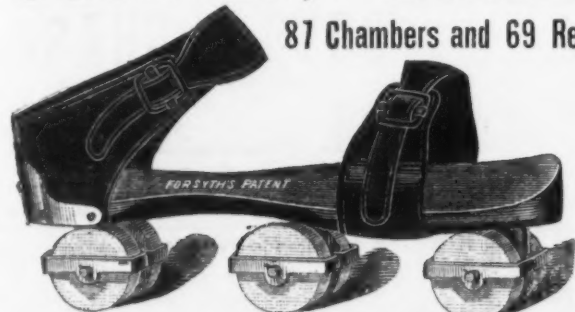
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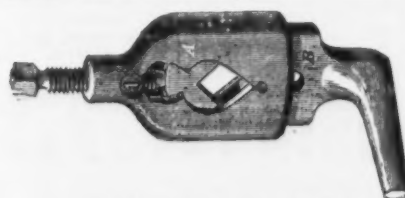
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3 ".....	4 50	6 50	6 75	8 75
5 ".....	7 50	10 00	10 00	12 50

DOUBLE JOINT HINGES.

(To Swing both Ways.)

To be used on Door 1 inch thick, or less.

SIZE.	WITHOUT ACORN TIPS.		WITH ACORN TIPS.	
	BRASS.	NICKEL PLATED.	BRASS.	NICKEL PLATED.
2 3/4 inch.....	\$ 6 60	\$ 9 00	\$11 50	\$14 25
3 ".....	8 30	11 50	13 50	17 00
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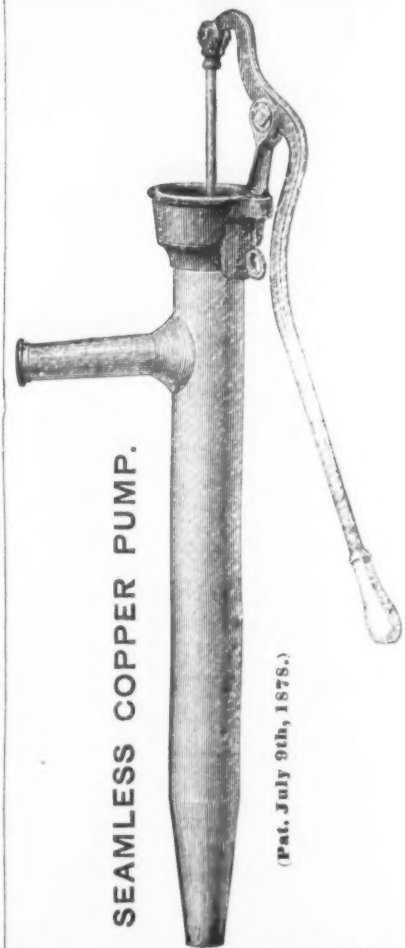
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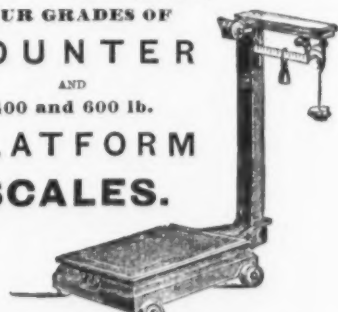
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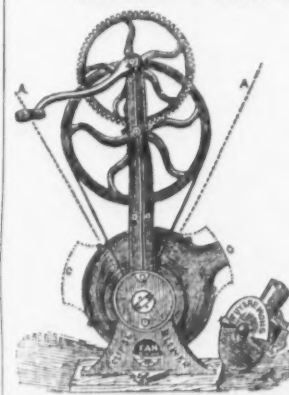


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of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach of the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

Advertisements are inserted in any language at the following

MODERATE TARIFF.

Size of Page—13 1/4 Inches Deep by 9 1/4 Inches Wide.

	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.
One page.....	Gold. \$30.00	Gold. \$33.75	Gold. \$37.50	Gold. \$10.00	Gold. \$11.25	Gold. \$12.50
Two-thirds page.....	22.00	24.75	27.50	7.50	8.45	9.40
Half page.....	17.00	19.15	21.25	6.20	7.00	7.75
One-third page.....	12.50	14.10	15.65	3.20	3.40	3.60

Advertisers will do well to use illustrations freely. Where economy of space is an object, a left page illustrated and described in one language can be suitably described in four or more languages on the opposite or right page without illustrating.

THE WHOLE FOREIGN HARDWARE TRADE,

so far as it experiences of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertiser inserted in the *Ironmonger* and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity not to be compared with any of the other ordinary channels of communication.

B. KREISCHER & SONS, FIRE BRICK.

BEST AND CHEAPEST.
Established 1845.
Office, foot of Houston Street, East River,
NEW YORK.

NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK
And Furnace Blocks
DRAIN PIPE & LAND TILE.
Woodbridge, - - - N. J.

BORGNER & O'BRIEN,

Manufacturers

FIRE BRICK

Edge Pressed Furnace Blocks,
CLAY RETORTS, TILES, &c.,
Twenty-third Street,
Above Race, PHILADELPHIA.
Twenty years' practical Experience.

PERTH AMBOY TERRA COTTA CO.,

Successors to

A. HALL & SONS, Perth Amboy, N. J.,
ARCHITECTURAL TERRA COTTA

FIRE BRICK.

170 Broadway, NEW YORK.

Brooklyn Clay Retort

FIRE BRICK WORKS.

Manufacturers of Clay Retorts, Fire Brick, Gas
House and other Tile, Cupola Brick, &c. Dealers in
and Miners of Fire Clay and Fire Sand. Clay bank at
Bar's Creek, New Jersey. Manufacture: Van Dyke,
Elizabeth, Richards and Partition Sts., Brooklyn, N. Y.
Office: No. 88 Van Dyke St.

Watson Fire Brick Manufactory,

ESTABLISHED 1836.

JOHN B. WATSON, Perth Amboy, New Jersey,
Manufacturer of

FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries,
Gas Works, Lime Kilns, Tanneries, Boiler
and Grate Setting, Glass Works, &c.
Fire Clay, Fire Sand, and Kaolin for Sale.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay

Retort Works,
Manufacturer of FIRE BRICK, HOLLOW

BRICK AND CLAY RETORTS.
WORKS: PERTH AMBOY, NEW JERSEY.

Office & Depot, 418 to 422 East 23d St., N. Y.

TROY FIRE BRICK WORKS,

Troy, N. Y.,

JAMES OSTRANDER & SON,

ESTABLISHED 1848,

Manufacturers of

FIRE BRICK,

Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and
Dealers in Woodbridge Fire Clay and Sand, and Staten
Island Kaolin.

Established 1864.

GARDNER BROTHERS,

Manufacturers of

STANDARD SAVAGE FIRE BRICK,

TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and
Miners and Shippers of Fire Clay.

OFFICE: 116 Smithfield St., Pittsburgh, Pa.
WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

HALL & SONS,

FIRE BRICK,

Buffalo, N. Y.

MILLER'S BRICK PRESSES

(Established 1844).

FIRE and RED BRICK,

And Brickmakers' Tools in General.

SAML. P. MILLER & SON,
309 South 5th St., Philadelphia.

RUDOLPH FRANK,

Office, 229 FULTON STREET,
NEW YORK.

ALUMINA and
SILICA

FIRE BRICKS

Works,
BROOKLYN, on
the East River.

Through Cars, Canal Boats
and Vessels loaded direct from the
Works to all points.

DUK'S IMPROVED ELEVATOR BUCKET.



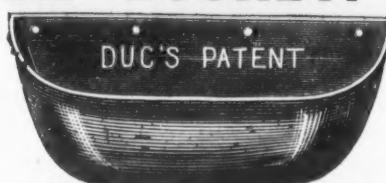
ALWAYS FIRST PREMIUM.

NO CORNERS TO CATCH.
THROWS FREE AND CLEAR.
200,000 IN USE.

Send for Circular.



MILL BUCKET.
In 3 1/2 in. to 10 in.



THE STOREHOUSE BUCKET.
(Partial straight front.)
In 12 in., 14 in., 16 in. and 17 in. Sizes.

Very Durable and Strong.

T. F. ROWLAND, Sole Manufacturer,
BROOKLYN, N. Y.

NICHOLSON FILE CO., Manufacturers of FILES AND RASPS.

ALSO

Filers' Tools & Specialties.

Manufactory and Offices at Providence, R. I.

The following space will be used in illustrating our specialties, the matter being changed weekly.

STUB FILES AND HOLDER.

FILES DETACHABLE. Patented May, 1878.



PILLAR. REAPER. PITSAW. THREE-SQUARE. CABINET.

The above engraving represents a useful and economical device for holding prepared stubs or short files, for shaping and finishing in and around depressions where the ordinary file could not be used, and is shown in the illustration at two-thirds its full size.

The shapes of these stubs may be of almost any of the varieties found in files; and their cut of any character or degree of coarseness required, either as rasp or file.

The character of cut may be varied to adapt them to the work, and in ordering, the nature of the work upon which the files are to be used, should be stated.

This kit will be found to be of especial service in working either upon wood or iron (as upon stove plate and soft metal patterns), stone and zinc monumental work, also in sculptural work in marble, and other work of a similar nature.

The Holder is attached to the files by simply turning the handle, and thus, by means of a screw, forcing the jaws open, and into the recesses prepared for them in the file-stubs. The files are released by turning the handle in the opposite direction.

The kit is prepared for the market in boxes, containing the Holder and six stub files, 2 inches in length. Their sizes and varied shapes will be seen by reference to the above illustrations.

PURE SILICA FIRE BRICK,

MADE BY THE

Landore Siemens Company,

Specially for OPEN-HEARTH FURNACES.

More "heats" obtained from them than from any other Bricks known.

Imported, to order only, by

PHILIP S. JUSTICE, Sole Agent in United States,

14 NORTH FIFTH STREET, PHILADELPHIA.



Established 1838
Bevin Bros. Mfg.
Co.,

Easthampton, Ct.

Manufacturers of

SLEIGH BELLS,

House, Tea, Hand,

Gong Bells, &c.

Bell Metal Kettles.

John T. Lewis & Bros
No. 231 South Front St.,
PHILADELPHIA.



TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge,
Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS

Brooklyn White Lead Co.



TRADE MARK

White Lead, Red Lead & Litharge.
59 Maiden Lane, NEW YORK.
FISHER HOWE, TREASURER.

JOHN JEWETT & SONS

Manufacturers of the well-known brand of

WHITE LEAD.



TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

182 Front Street, NEW YORK.

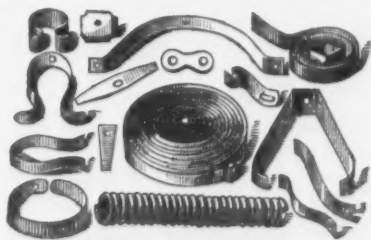


TRADE MARK.

The Atlantic White Lead
and Linseed Oil Co.,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead,
Litharge & Linseed Oil.
ROBERT COLGATE & CO.,
257 Pearl Street, New York



DUNBAR BROS.,

Manufacturers of

Clock Springs and Small Springs

of every description, from best Cast Steel,

BRISTOL, CONN.

W. & J. TIEBOUT,

Manufacturers of

Brass, Galvanized & Ship

Chandlery Hardware,

No. 33 Chambers St., New York.

ORGANS

13 Stops, 3 set Reeds, Stool, Book,
only \$65. Planos, Stool, Cover &
Book only \$143.75. Patent Trade.
D. F. BEATTY, Washington, N. J.

PHILADELPHIA.

(Corrected Weekly by Lloyd, Supple & Walton.)
Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Amvils.	110 net
Peter Wrights, 7 1/2	110 net
Over 20 lbs.	110 net
Eagle (American)	100 1/2 net
Apple Parers.	per doz \$5.00 net
Reading No. 7.	6.00 net
No. 7 1/2.	7.00 net
No. 7 3/4.	7.50 net
Peach Parers.	15.00 net
Little Favorite, corer and slicer.	7.50 net
Lots of 10 to 25 dozen special price.	
Axes.	
Hunt's Kentucky and Yankee.	per doz \$11.00
Mann's Red Warrior.	11.00
Richland Chief.	10.00
Beveled Axes.	add 50c
Double Bit Axes.	22.00
Augers and Auger Bits, -New List January 1.	
Bates' Nut Augers.	dis 40c
Cook's Augers.	dis 40c
Watrous' Ship Augers.	dis 15c
Benjamin Pierce Auger Bits.	dis 35c
Griswold Auger Bits.	dis 40c
Cook's.	dis 40c
Jennings.	dis 10c
Honey's Pat. Hol. Augers, list \$4.00	dis 20c
Stearns' Pat. Hol. Augers, list \$4.00	dis 20c
Balances.	
Light and Common.	dis 15c
Bells.	
Bevin Bros. Mfg. Co. Light Hand Bells.	dis 60c
Swiss Pattern Hand Bells.	dis 60c
Connell's Door Bells.	dis 30c
St. Western & Kentucky Cow, new list.	dis 40c
Belt and Hivet Tappers.	
Chambers' No. 20 & 30.	each, \$7.50
No. 2.	9.00
No. 3.	12.00
Horine Machines.	
Upright, without Augers.	dis 50c
Angular, without Augers.	dis 35c
Boles, -Eastern Carriage Boles.	dis 60c, cash
Philadelphia.	new list dis 40c
Stanley, Wrought Shutter.	dis 40c
Braces, -Barber's.	dis 40c
Backus.	dis 50c
Spofford.	dis 50c
American Ball.	dis 10c
Butts, -Cast Fast Joint, Narrow.	dis 10c
Dis 20c	
Cast Loose Joint, Narrow.	dis 25c
Broad.	dis 25c
" Acorn, Loose Joint.	dis 25c
" Jap'd.	dis 30c
" Mayer's Loose Joint.	dis 30c
Wrought Loose Joint.	dis 30c
Table Hinges and Back Flaps.	dis 25c
Narrow, Fast.	dis 25c
Loose Joint.	dis 25c
Blind Butts.	
Parker.	dis 60c
Clark.	dis 60c
Shepard.	dis 60c
Lull & Porter.	dis 60c
Hunter's.	dis 60c
Chains, -German Hailer and Coll. new list Oct. 22.	dis 20c
1870.	dis 20c
Best Proof Coll Chain-English.	dis 110 net
13 1/2 1/4 5/8 7/8 1 1/2	dis 7 1/2
Chisels, -Socket Framing.	dis 55c
Socket Primer.	dis 55c
Butcher's.	dis 55c
Centers, -Bed.	dis 15c
Plate.	dis 15c
Coffee Mills, -Box and Slide, new list Jan. 1.	dis 35c
Enterprise.	dis 15c
Cutlery, -Walden Pocket.	new list
Landers, Frary & Clark, Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.	
Drawing Knives.	dis 55c
Hart Mfg. Co.'s.	dis 55c
Adjustable Handle.	dis 15c
Fry Pans.	
Tinned.	dis 45c
per doz \$3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00	
Burnished.	dis 45c
per doz \$3.00 3.75 4.25 4.75 5.25 5.75 6.00 7.00 8.00 9.00	
Files.	
Nicholson.	dis 20c
Diaston.	dis 20c
Butcher.	dis 20c
Spencer.	dis 20c
Finishing Machine.	dis 40c
Eagle, 1/4 in. roll.	each, \$2.15
1/2 in. roll.	2.85
Crown, 1/4 in. roll.	3.50
1/2 in. roll.	4.00
Geneva Fluter.	dis 20c
Favorite Comb. Fluter & Bad Iron.	per doz \$10.50 net
Hammers.	
Yerkes & Plumb, new list.	dis 15c
Hatches.	
Yerkes & Plumb, new list.	dis 15c
Hunt.	dis 15c
Hinges.	
Strap and T.	dis 20c
Horse Nails.	dis 9c
Autiable.	dis 20c
Blued and Pointed.	dis 20c
Globe.	dis 20c
Clinton.	dis 20c
Polished & Pointed.	dis 20c
Porter, all sizes.	dis 15c
Discount on Autiable and Clinton, 20c; Globe, 10c	
Locks and Knobs.	
Brantford.	dis 30c
Gaylord Cabinet.	dis 30c
American Padlocks.	dis 30c
Scandinavian Padlocks.	dis 30c
No. 37.	dis 30c
No. 38.	dis 30c
No. 39.	dis 30c
No. 40.	dis 30c
No. 41.	dis 30c
No. 42.	dis 30c
No. 43.	dis 30c
No. 44.	dis 30c
No. 45.	dis 30c
No. 46.	dis 30c
No. 47.	dis 30c
No. 48.	dis 30c
No. 49.	dis 30c
No. 50.	dis 30c
No. 51.	dis 30c
No. 52.	dis 30c
No. 53.	dis 30c
No. 54.	dis 30c
No. 55.	dis 30c
No. 56.	dis 30c
No. 57.	dis 30c
No. 58.	dis 30c
No. 59.	dis 30c
No. 60.	dis 30c
No. 61.	dis 30c
No. 62.	dis 30c
No. 63.	dis 30c
No. 64.	dis 30c
No. 65.	dis 30c
No. 66.	dis 30c
No. 67.	dis 30c
No. 68.	dis 30c
No. 69.	dis 30c
No. 70.	dis 30c
No. 71.	dis 30c
No. 72.	dis 30c
No. 73.	dis 30c
No. 74.	dis 30c
No. 75.	dis 30c
No. 76.	dis 30c
No. 77.	dis 30c
No. 78.	dis 30c
No. 79.	dis 30c
No. 80.	dis 30c
No. 81.	dis 30c
No. 82.	dis 30c
No. 83.	dis 30c
No. 84.	dis 30c
No. 85.	dis 30c
No. 86.	dis 30c
No. 87.	dis 30c
No. 88.	dis 30c
No. 89.	dis 30c
No. 90.	dis 30c
No. 91.	dis 30c
No. 92.	dis 30c
No. 93.	dis 30c
No. 94.	dis 30c
No. 95.	dis 30c
No. 96.	dis 30c
No. 97.	dis 30c
No. 98.	dis 30c
No. 99.	dis 30c
No. 100.	dis 30c

Britannia, Boardman's.	dis 55c
Tinned.	dis 55c
Parker's.	dis 55c
Spring.	dis 55c
Philadelphia.	dis 55c
Chatfield No. 1.	dis 55c
Gen. Coll. No. 1.	dis 55c
No. 2, Medium Jap'd.	dis 55c
No. 3, Small Jap'd.	dis 55c
Stocks and Dies.	dis 55c
Stove Polish, -Gem.	dis 55c
Only.	dis 55c
Tacks, Brads, &c.	dis 55c
Shoe Nails.	dis 55c
Double Pointed Tacks.	dis 55c
Traps.	dis 55c
Genuine Onida, -Newhouse.	dis 55c
Im. Onida, -Newhouse list, first qual.	dis 55c
Vices, -Solid Box, Trenton new list.	dis 55c
Wrenches, -Agricultural.	dis 55c
Cres' Genuine.	dis 55c
" Mechanics.	dis 55c
Phila. Tool Co., Duplex.	dis 55c
Wire.	
Bright or Ann'd, No. 6 to 18.	dis 55c
No. 10 to 26.	dis 55c
No. 27 to 36.	dis 55c
Coppered, 10 to 18.	dis 55c
Tinned Broom Wire.	dis 55c
Galvanized, No. 7 to 18.	dis 55c
Wringers.	
Peerless No. 24.	dis 55c
Universal, No. 24.	dis 55c
Novelty, No. 10.	dis 55c

PITTSBURGH.

Merchant Iron.		
TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.		
Flat Bar.		
1 1/2 to 4 by 1/2 to 1 inch.	dis	4.00
1 1/2 to 4 by 1/2 to 1 1/4.	dis	4.10
1 1/2 to 4 by 1 1/4 to 1 1/2.	dis	4.20
1 1/2 to 4 by 1 1/2 to 1 3/4.	dis	4.30
1 1/2 to 4 by 1 3/4 to 2.	dis	4.40
1 1/2 to 4 by 2 to 2 1/4.	dis	4.50
1 1/2 to 4 by 2 1/4 to 2 1/2.	dis	4.60
1 1/2 to 4 by 2 1/2 to 2 3/4.	dis	4.70
1 1/2 to 4 by 2 3/4 to 3.	dis	4.80
1 1/2 to 4 by 3 to 3 1/4.	dis	4.90
1 1/2 to 4 by 3 1/4 to 3 1/2.	dis	5.00
1 1/2 to 4 by 3 1/2 to 3 3/4.	dis	5.10
1 1/2 to 4 by 3 3/4 to 4.	dis	5.20
1 1/2 to 4 by 4 to 4 1/4.	dis	5.30
1 1/2 to 4 by 4 1/4 to 4 1/2.	dis	5.40
1 1/2 to 4 by 4 1/2 to 4 3/4.	dis	5.50
1 1/2 to 4 by 4 3/4 to 5.	dis	5.60
1 1/2 to 4 by 5 to 5 1/4.	dis	5.70
1 1/2 to 4 by 5 1/4 to 5 1/2.	dis	5.80
1 1/2 to 4 by 5 1/2 to 5 3/4.	dis	5.90
1 1/2 to 4 by 5 3/4 to 6.	dis	6.00
1 1/2 to 4 by 6 to 6 1/4.	dis	6.10
1 1/2 to 4 by 6 1/4 to 6 1/2.	dis	6.20
1 1/2 to 4 by 6 1/2 to 6 3/4.	dis	6.30
1 1/2 to 4 by 6 3/4 to 7.	dis	6.40
1 1/2 to 4 by 7 to 7 1/4.	dis	6.50
1 1/2 to 4 by 7 1/4 to 7 1/2.	dis	6.60
1 1/2 to 4 by 7 1/2 to 7 3/4.	dis	6.70
1 1/2 to 4 by 7 3/4 to 8.	dis	6.80
1 1/2 to 4 by 8 to 8 1/4.	dis	6.90
1 1/2 to 4 by 8 1/4 to 8 1/2.	dis	7.00
1 1/2 to 4 by 8 1/2 to 8 3/4.	dis	7.10
1 1/2 to 4 by 8 3/4 to 9.	dis	7.20
1 1/2 to 4 by 9 to 9 1/4.	dis	7.30
1 1/2 to 4 by 9 1/4 to 9 1/2.	dis	7.40
1 1/2 to 4 by 9 1/2 to 9 3/4.	dis	7.50
1 1/2 to 4 by 9 3/4 to 10.	dis	7.60
1 1/2 to 4 by 10 to 10 1/4.	dis	7.70
1 1/2 to 4 by 10 1/4 to 10 1/2.	dis	7.80
1 1/2 to 4 by 10 1/2 to 10 3/4.	dis	7.90
1 1/2 to 4 by 10 3/4 to 11.	dis	8.00
1 1/2 to 4 by 11 to 11 1/4.	dis	8.10
1 1/2 to 4 by 11 1/4 to 11 1/2.	dis	8.20
1 1/2 to 4 by 11 1/2 to 11 3/4.	dis	8.30
1 1/2 to 4 by 11 3/4 to 12.	dis	8.40
1 1/2 to 4 by 12 to 12 1/4.	dis	8.50
1 1/2 to 4 by 12 1/4 to 12 1/2.	dis	8.60
1 1/2 to 4 by 12 1/2 to 12 3/4.	dis	8.70
1 1/2 to 4 by 12 3/4 to 13.	dis	8.80
1 1/2 to 4 by 13 to 13 1/4.	dis	8.90
1 1/2 to 4 by 13 1/4 to 13 1/2.	dis	9.00
1 1/2 to 4 by 13 1/2 to 13 3/4.	dis	9.10
1 1/2 to 4 by 13 3/4 to 14.	dis	9.20
1 1/2 to 4 by 14 to 14 1/4.	dis	9.30
1 1/2 to 4 by 14 1/4 to 14 1/2.	dis	9.40
1 1/2 to 4 by 14 1/2 to 14 3/4.	dis	9.50
1 1/2 to 4 by 14 3/4 to 15.	dis	9.60
1 1/2 to 4 by 15 to 15 1/4.	dis	9.70
1 1/2 to 4 by 15 1/4 to 15 1/2.	dis	9.80
1 1/2 to 4 by 15 1/2 to 15 3/4.	dis	9.90
1 1/2 to 4 by 15 3/4 to 16.	dis	10.00
1 1/2 to 4 by 16 to 16 1/4.	dis	10.10
1 1/2 to 4 by 16 1/4 to 16 1/2.	dis	10.20
1 1/2 to 4 by 16 1/2 to 16 3/4.	dis	10.30
1 1/2 to 4 by 16 3/4 to 17.	dis	10.40
1 1/2 to 4 by 17 to 17 1/4.	dis	10.50
1 1/2 to 4 by 17 1/4 to 17 1/2.	dis	10.60
1 1/2 to 4 by 17 1/2 to 17 3/4.	dis	10.70
1 1/2 to 4 by 17 3/4 to 18.	dis	10.80
1 1/2 to 4 by 18 to 18 1/4.	dis	10.90
1 1/2 to 4 by 18 1/4 to 18 1/2.	dis	11.00
1 1/2 to 4 by 18 1/2 to 18 3/4.	dis	11.10
1 1/2 to 4 by 18 3/4 to 19.	dis	11.20
1 1/2 to 4 by 19 to 19 1/4.	dis	11.30
1 1/2 to 4 by 19 1/4 to 19 1/2.	dis	11.40
1 1/2 to 4 by 19 1/2 to 19 3/4.	dis	11.50
1 1/2 to 4 by 19 3/4 to 20.	dis	11.60
1 1/2 to 4 by 20 to 20 1/4.	dis	11.70
1 1/2 to 4 by 20 1/4 to 20 1/2.	dis	11.80
1 1/2 to 4 by 20 1/2 to 20 3/4.	dis	11.90
1 1/2 to 4 by 20 3/4 to 21.	dis	12.00
1 1/2 to 4 by 21 to 21 1/4.	dis	12.10
1 1/2 to 4 by 21 1/4 to 21 1/2.	dis	12.20
1 1/2 to 4 by 21 1/2 to 21 3/4.	dis	12.30
1 1/2 to 4 by 21 3/4 to 22.	dis	12.40
1 1/2 to 4 by 22 to 22 1/4.	dis	12.50
1 1/2 to 4 by 22 1/4 to 22 1/2.	dis	12.60
1 1/2 to 4 by 22 1/2 to 22 3/4.	dis	12.70
1 1/2 to 4 by 22 3/4 to 23.	dis	12.80
1 1/2 to 4 by 23 to 23 1/4.	dis	12.90
1 1/2 to 4 by 23 1/4 to 23 1/2.	dis	13.00
1 1/2 to 4 by 23 1/2 to 23 3/4.	dis	13.10
1 1/2 to 4 by 23 3/4 to 24.	dis	13.20
1 1/2 to 4 by 24 to 24 1/4.	dis	13.30
1 1/2 to 4 by 24 1/4 to 24 1/2.	dis	13.40
1 1/2 to 4 by 24 1/2 to 24 3/4.	dis	13.50
1 1/2 to 4 by 24 3/4 to 25.	dis	13.60
1 1/2 to 4 by 25 to 25 1/4.	dis	13.70
1 1/2 to 4 by 25 1/4 to 25 1/2.	dis	13.80
1 1/2 to 4 by 25 1/2 to 25 3/4.	dis	13.90
1 1/2 to 4 by 25 3/4 to 26.	dis	14.00
1 1/2 to 4 by 26 to 26 1/4.	dis	14.10
1 1/2 to 4 by 26 1/4 to 26 1/2.	dis	14.20
1 1/2 to 4 by 26 1/2 to 26 3/4.	dis	14.30
1 1/2 to 4 by 26 3/4 to 27.	dis	14.40
1 1/2 to 4 by 27 to 27 1/4.	dis	14.50
1 1/2 to 4 by 27 1/4 to 27 1/2.	dis	14.60
1 1/2 to 4 by 27 1/2 to 27 3/4.	dis	14.70
1 1/2 to 4 by 27 3/4 to 28.	dis	14.80
1 1/2 to 4 by 28 to 28 1/4.	dis	14.90
1 1/2 to 4 by 28 1/4 to 28 1/2.	dis	15.00
1 1/2 to 4 by 28 1/2 to 28 3/4.	dis	15.10
1 1/2 to 4 by 28 3/4 to 29.	dis	15.20
1 1/2 to 4 by 29 to 29 1/4.	dis	15.30
1 1/2 to 4 by 29 1/4 to 29 1/2.	dis	15.40
1 1/2 to 4 by 29 1/2 to 29 3/4.	dis	15.50
1 1/2 to 4 by 29 3/4 to 30.	dis	15.60
1 1/2 to 4 by 30 to 30 1/4.	dis	15.70
1 1/2 to 4 by 30 1/4 to 30 1/2.	dis	15.80
1 1/2 to 4 by 30 1/2 to 30 3/4.	dis	15.90
1 1/2 to 4 by 30 3/4 to 31.	dis	16.00
1 1/2 to 4 by 31 to 31 1/4.	dis	16.10
1 1/2 to 4 by 31 1/4 to 31 1/2.	dis	16.20
1 1/2 to 4 by 31 1/2 to 31 3/4.	dis	16.30
1 1/2 to 4 by 31 3/4 to 32.	dis	16.40
1 1/2 to 4 by 32 to 32 1/4.	dis	16.50
1 1/2 to 4 by 32 1/4 to 32 1/2.	dis	16.60
1 1/2 to 4 by 32 1/2 to 32 3/4.	dis	16.70
1 1/2 to 4 by 32 3/4 to 33.	dis	16.80
1 1/2 to 4 by 33 to 33 1/4.	dis	16.90
1 1/2 to 4 by 33 1/4 to 33 1/2.	dis	17.00
1 1/2 to 4 by 33 1/2 to 33 3/4.	dis	17.10
1 1/2 to 4 by 33 3/4 to 34.	dis	17.20
1 1/2 to 4 by 34 to 34 1/4.	dis	17.30
1 1/2 to 4 by 34 1/4 to 34 1/2.	dis	17.40
1 1/2 to 4 by 34 1/2 to 34 3/4.	dis	17.50
1 1/2 to 4 by 34 3/4 to 35.	dis	17.60
1 1/2 to 4 by 35 to 35 1/4.	dis	17.70
1 1/2 to 4 by 35 1/4 to 35 1/2.	dis	17.80
1 1/2 to 4 by 35 1/2 to 35 3/4.	dis	17.90
1 1/2 to 4 by 35 3/4 to 36.	dis	18.00
1 1/2 to 4 by 36 to 36 1/4.	dis	18.10
1 1/2 to 4 by 36 1/4 to 36 1/2.	dis	18.20
1 1/2 to 4 by 36 1/2 to 36 3/4.	dis	18.30
1 1/2 to 4 by 36 3/4 to 37.	dis	18.40
1 1/2 to 4 by 37 to 37 1/4.	dis	18.50
1 1/2 to 4 by 37 1/4 to 37 1/2.	dis	18.60
1 1/2 to 4 by 37 1/2 to 37 3/4.	dis	18.70
1 1/2 to 4 by 37 3/4 to 38.	dis	18.80
1 1/2 to 4 by 38 to 38 1/4.	dis	18.90
1 1/2 to 4 by 38 1/4 to 38 1/2.	dis	19.00
1 1/2 to 4 by 38 1/2 to 38 3/4.	dis	19.10
1 1/2 to 4 by 38 3/4 to 39.	dis	19.20
1 1/2 to 4 by 39 to 39 1/4.	dis	19.30
1 1/2 to 4 by 39 1/4 to 39 1/2.	dis	19.40
1 1/2 to 4 by 39 1/2 to 39 3/4.	dis	19.50
1 1/2 to 4 by 39 3/4 to 40.	dis	19.60
1 1/2 to 4 by 40 to 40 1/4.	dis	19.70
1 1/2 to 4 by 40 1/4 to 40 1/2.	dis	19.80
1 1/2 to 4 by 40 1/2 to 40 3/4.	dis	19.90
1 1/2 to 4 by 40 3/4 to 41.	dis	20.00
1 1/2 to 4 by 41 to 41 1/4.	dis	20.10
1 1/2 to 4 by 41 1/4 to 41 1/2.	dis	20.20
1 1/2 to 4 by 41 1/2 to 41 3/4.	dis	20.30
1 1/2 to 4 by 41 3/4 to 42.	dis	20.40
1 1/2 to 4 by 42 to 42 1/4.	dis	20.50
1 1/2 to 4 by 42 1/4 to 42 1/2.	dis	20.60
1 1/2 to 4 by 42 1/2 to 42 3/4.	dis	20.70
1 1/2 to 4 by 42 3/4 to 43.	dis	20.80
1 1/2 to 4 by 43 to 43 1/4.	dis	20.90
1 1/2 to 4 by 43 1/4 to 43 1/2.	dis	21.00
1 1/2 to 4 by 43 1/2 to 43 3/4.	dis	21.10
1 1/2 to 4 by 43 3/4 to 44.	dis	21.20
1 1/2 to 4 by 44 to 44 1/4.	dis	21.30
1 1/2 to 4 by 44 1/4 to 44 1/2.	dis	21.40
1 1/2 to 4 by 44 1/2 to 44 3/4.	dis	21.50
1 1/2 to 4 by 44 3/4 to 45.	dis	21.60
1 1/2 to 4 by 45 to 45 1/4.	dis	21.70
1 1/2 to 4 by 45 1/4 to 45 1/2.	dis	21.80
1 1/2 to 4 by 45 1/2 to 45 3/4.	dis	21.90
1 1/2 to 4 by 45 3/4 to 46.	dis	22.00
1 1/2 to 4 by 46 to 46 1/4.	dis	22.10
1 1/2 to 4 by 46 1/4 to 46 1/2.	dis	22.20
1 1/2 to 4 by 46 1/2 to 46 3/4.	dis	22.30
1 1/2 to 4 by 46 3/4 to 47.	dis	22.40
1 1/2 to 4 by 47 to 47 1/4.	dis	22.50
1 1/2 to 4 by 47 1/4 to 47 1/2.	dis	22.60
1 1/2 to 4 by 47 1/2 to 47 3/4.	dis	22.70
1 1/2 to 4 by 47 3/4 to 48.	dis	22.80
1 1/2 to 4 by 48 to 48 1/4.	dis	22.90
1 1/2 to 4 by 48 1/4 to 48 1/2.	dis	23.00
1 1/2 to 4 by 48 1/2 to 48 3/4.	dis	23.10
1 1/2 to 4 by 48 3/4 to 49.	dis	23.20
1 1/2 to 4 by 49 to 49 1/4.	dis	23.30
1 1/2 to 4 by 49 1/4 to 49 1/2.	dis	23.40
1 1/2 to 4 by 49 1/2 to 49 3/4.	dis	23.50
1 1/2 to 4 by 49 3/4 to 50.	dis	23.60
1 1/2 to 4 by 50 to 50 1/4.	dis	23.70
1 1/2 to 4 by 50 1/4 to 50 1/2.	dis	23.80
1 1/2 to 4 by 50 1/2 to 50 3/4.	dis	23.90
1 1/2 to 4 by 50 3/4 to 51.	dis	24.00
1 1/2 to 4 by 51 to 51 1/4.	dis	24.10
1 1/2 to 4 by 51 1/4 to 51 1/2.	dis	24.20
1 1/2 to 4 by 51 1/2 to 51 3/4.	dis	24.30
1 1/2 to 4 by 51 3/4 to 52.	dis	24.40
1 1/2 to 4 by 52 to 52 1/4.	dis	24.50
1 1/2 to 4 by 52 1/4 to 52 1/2.	dis	24.60
1 1/2 to 4 by 52 1/2 to 52 3/4.	dis	24.70
1 1/2 to 4 by 52 3/4 to 53.	dis	24.80
1 1/2 to 4 by 53 to 53 1/4.	dis	24.90
1 1/2 to 4 by 53 1/4 to 53 1/2.	dis	25.00
1 1/2 to 4 by 53 1/2 to 53 3/4.	dis	25.10
1 1/2 to 4 by 53 3/4 to 54.	dis	25.20
1 1/2 to 4 by 54 to 54 1/4.	dis	25.30
1 1/2 to 4 by 54 1/4 to 54 1/2.	dis	25.40
1 1/2 to 4 by 54 1/2 to 54 3/4.	dis	25.50
1 1/2 to 4 by 54 3/4 to 55.	dis	25.60
1 1/2 to 4 by 55 to 55 1/4.	dis	25.70
1 1/2 to 4 by 55 1/4 to 55 1/2.	dis	25.80
1 1/2 to 4 by 55 1/2 to 55 3/4.	dis	25.90
1 1/2 to 4 by 55 3/4 to 56.	dis	26.00
1 1/2 to 4 by 56 to 56 1/4.	dis	26.10
1 1/2 to 4 by 56 1/4 to 56 1/2.	dis	26.20
1 1/2 to 4 by 56 1/2 to 56 3/4.	dis	26.30
1 1/2 to 4 by 56 3/4 to 57.	dis	26.40
1 1/2 to 4 by 57 to 57 1/4.	dis	26.50
1 1/2 to 4 by 57 1/4 to 57 1/2.	dis	26.60
1 1/2 to 4 by 57 1/2 to 57 3/4.	dis	26.70
1 1/2 to 4 by 57 3/4 to 58.	dis	26.80
1 1/2 to 4 by 58 to 58 1/4.	dis	26.90
1 1/2 to 4 by 58 1/4 to 58 1/2.	dis	27.00
1 1/2 to 4 by 58 1/2 to 58 3/4.	dis	27.10
1 1/2 to 4 by 58 3/4 to 59.	dis	27.20
1 1/2 to 4 by 59 to 59 1/4.	dis	27.30
1 1/2 to 4 by 59 1/4 to 59 1/2.	dis	27.40
1 1/2 to 4 by 59 1/2 to 59 3/4.	dis	27.50
1 1/2 to 4 by 59 3/4 to 60.	dis	27.60
1 1/2 to 4 by 60 to 60 1/4.	dis	27.70
1 1/2 to 4 by 60 1/4 to 60 1/2.	dis	27.80
1 1/2 to 4 by 60 1/2 to 60 3/4.	dis	27.90
1 1/2 to 4 by 60 3/4 to 61.	dis	28.00
1 1/2 to 4 by 61 to 61 1/4.	dis	28.10
1 1/2 to 4 by 61 1/4 to 61 1/2.	dis	28.20
1 1/2 to 4 by 61 1/2 to 61 3/4.	dis	28.30
1 1/2 to 4 by 61 3/4 to 62.	dis	28.40
1 1/2 to 4 by 62 to 62 1/4.	dis	28.50
1 1/2 to 4 by 62 1/4 to 62 1/2.	dis	28.60
1 1/2 to 4 by 62 1/2 to 62 3/4.	dis	28.70
1 1/2 to 4 by 62 3/4 to 63.	dis	28.80
1 1/2 to 4 by 63 to 63 1/4.	dis	28.90
1 1/2 to 4 by 63 1/4 to 63 1/2.	dis	29.00
1 1/2 to 4 by 63 1/2 to 63 3/4.	dis	29.10
1 1/2 to 4 by 63 3/4 to 64.	dis	29.20
1 1/2 to 4 by 64 to 64 1/4.	dis	29.30
1 1/2 to 4 by 64 1/4 to 64 1/2.	dis	29.40
1 1/2 to 4 by 64 1/2 to 64 3/4.	dis	29.50
1 1/2 to 4 by 64 3/4 to 65.	dis	29.60
1 1/2 to 4 by 65 to 65 1/4.	dis	29.70
1 1/2 to 4 by 65 1/4 to 65 1/2.	dis	29.80
1 1/2 to 4 by 65 1/2 to 65 3/4.	dis	29.90
1 1/2 to 4 by 65 3/4 to 66.	dis	30.00
1 1/2 to 4 by 66 to 66 1/4.	dis	30.10
1 1/2 to 4 by 66 1/4 to 66 1/2.	dis	30.20
1 1/2 to 4 by 66 1/2 to 66 3/4.	dis	30.30
1 1/2 to 4 by 66 3/4 to		

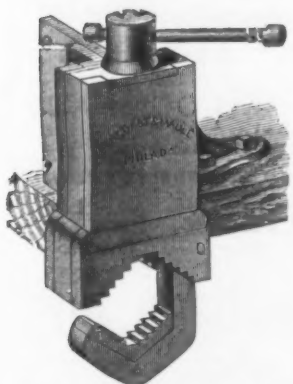
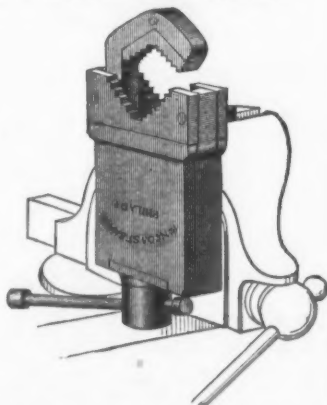
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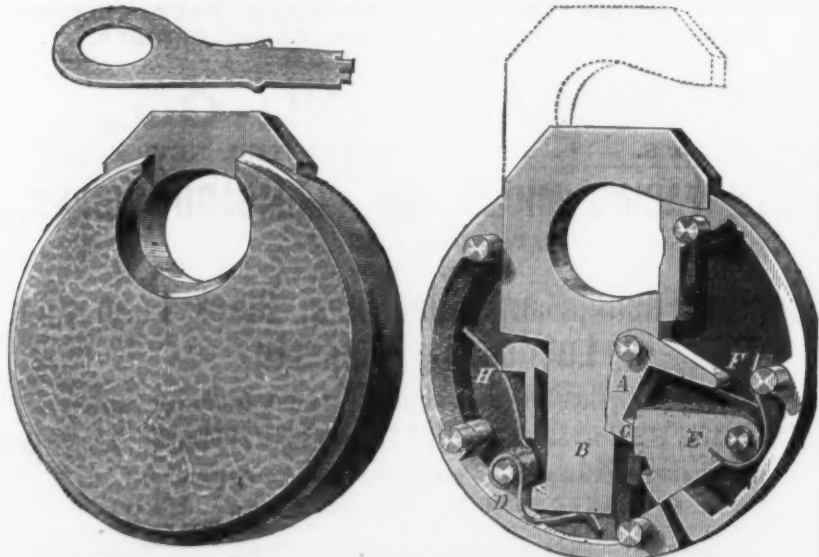
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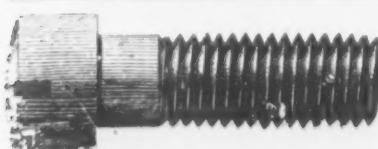
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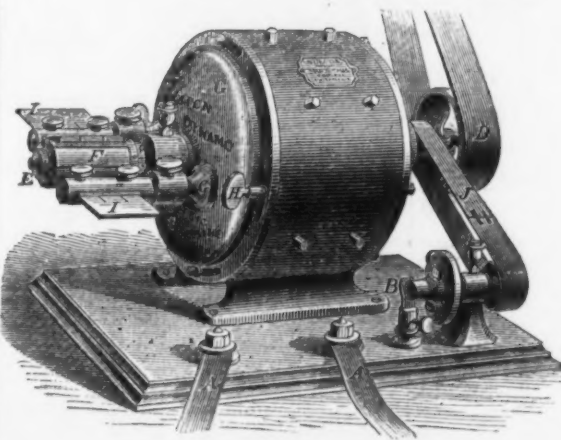
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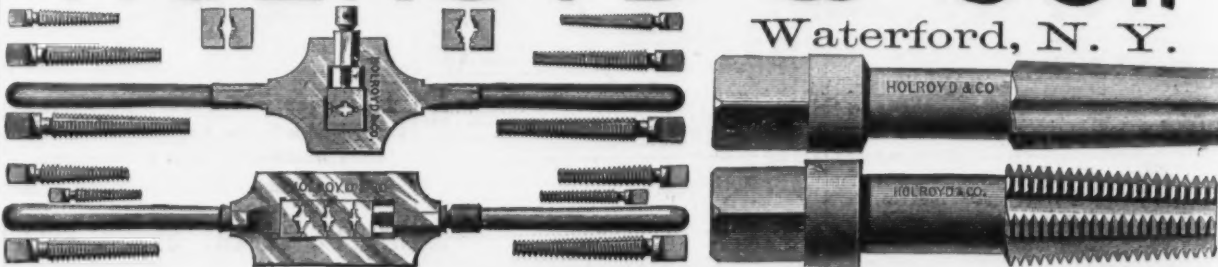
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View of Rock Breaker.

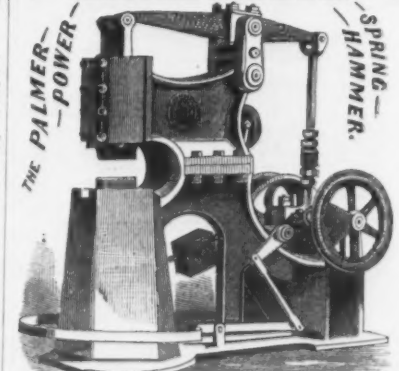
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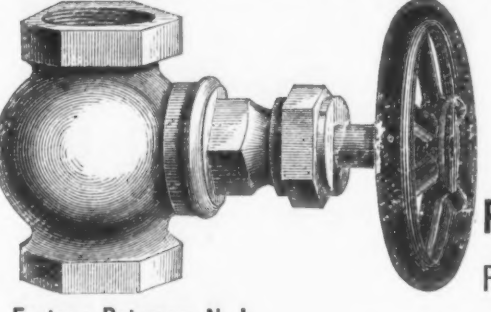
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2. It is self-expanding, the base of the bucket being 1/4 of an inch larger at bottom than core in the tubes, which allows it to expand, and the groove in the side to contract.
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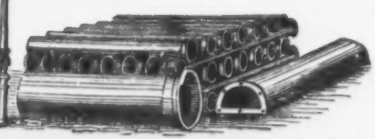
The Most Durable and Best Selling
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It has no valves to become obstructed and no screw joints to become immovable by rust.
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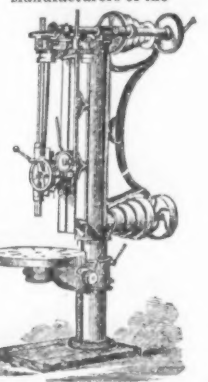
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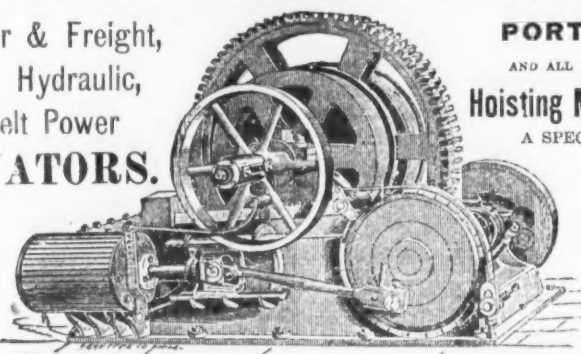
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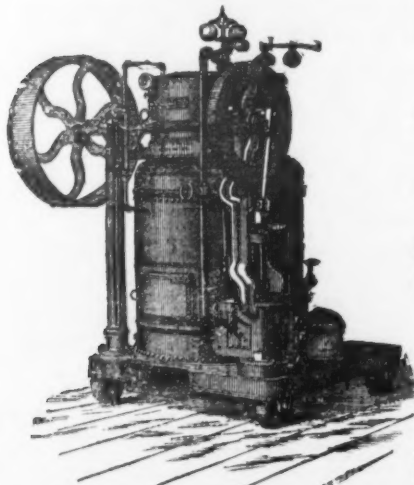
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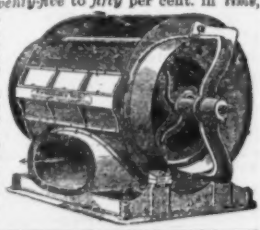
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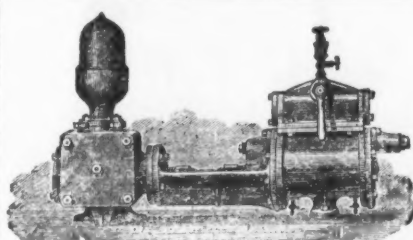
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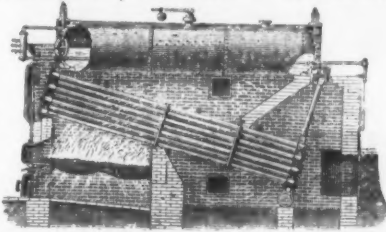
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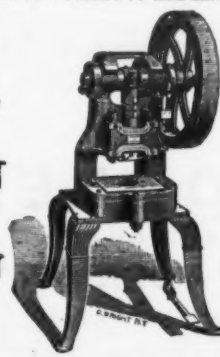
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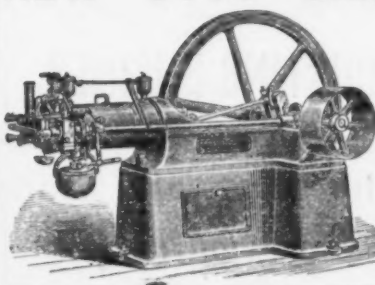
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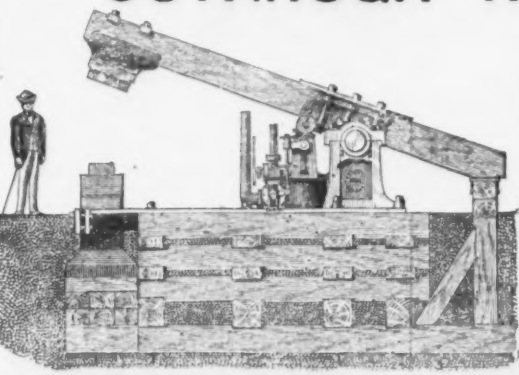
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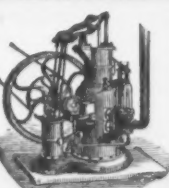
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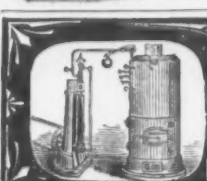


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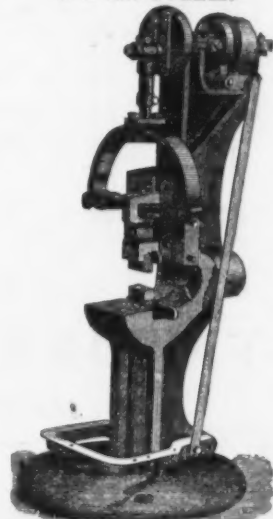
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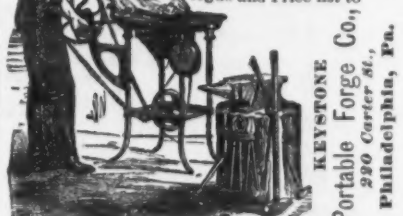
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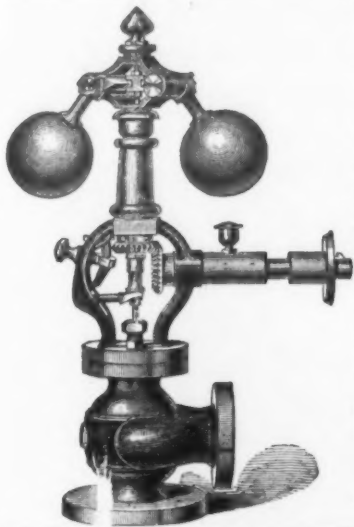
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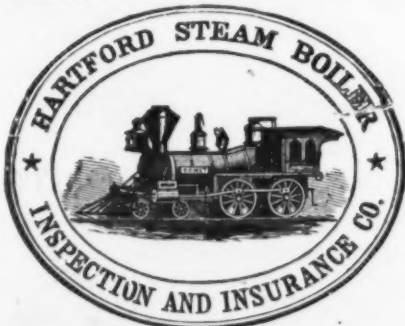


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3/4 in.	20.00	23.00	2.25	2.50	1.00	6.00
1 in.	23.00	27.00	2.50	2.75	1.00	7.50
1 1/4 in.	27.00	31.00	3.00	3.25	1.00	9.00
1 1/2 in.	30.00	35.00	3.50	3.75	1.00	10.00
2 in.	35.00	40.00	4.00	4.25	1.00	11.00
2 1/2 in.	40.00	45.00	4.50	4.75	1.00	12.00
3 in.	45.00	50.00	5.00	5.25	1.00	13.00
3 1/2 in.	50.00	55.00	5.50	5.75	1.00	14.00
4 in.	55.00	60.00	6.00	6.25	1.00	15.00
4 1/2 in.	60.00	65.00	6.50	6.75	1.00	16.00
5 in.	65.00	70.00	7.00	7.25	1.00	17.00
5 1/2 in.	70.00	75.00	7.50	7.75	1.00	18.00
6 in.	75.00	80.00	8.00	8.25	1.00	19.00
6 1/2 in.	80.00	85.00	8.50	8.75	1.00	20.00
7 in.	85.00	90.00	9.00	9.25	1.00	21.00
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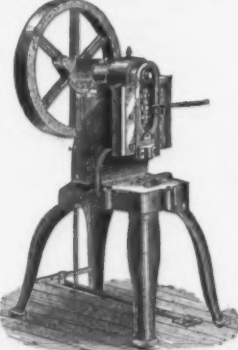
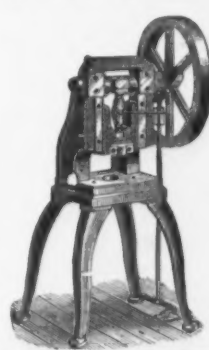
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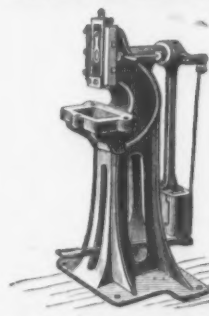
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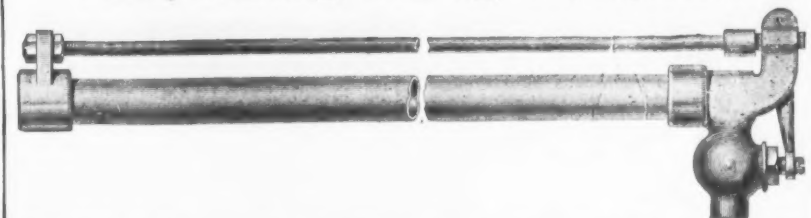
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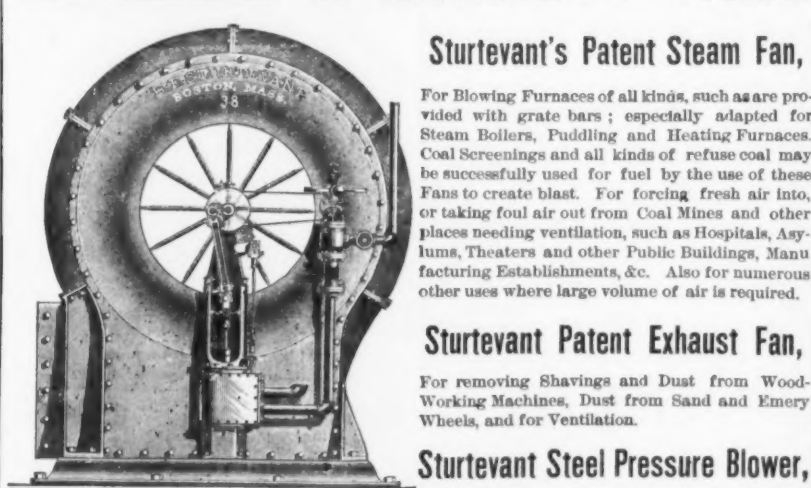
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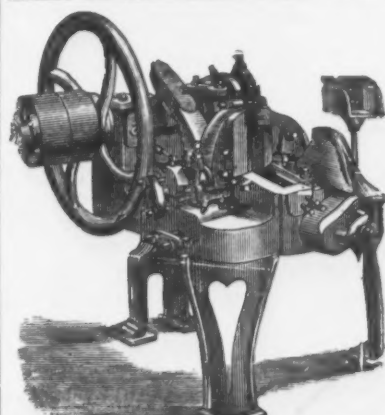
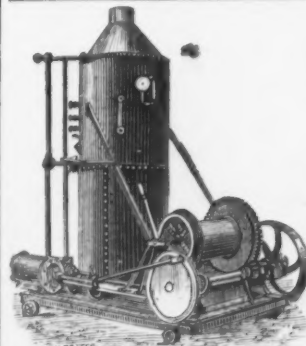
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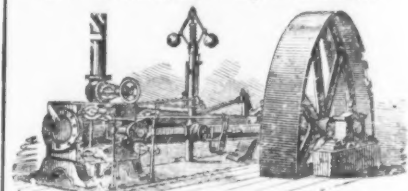
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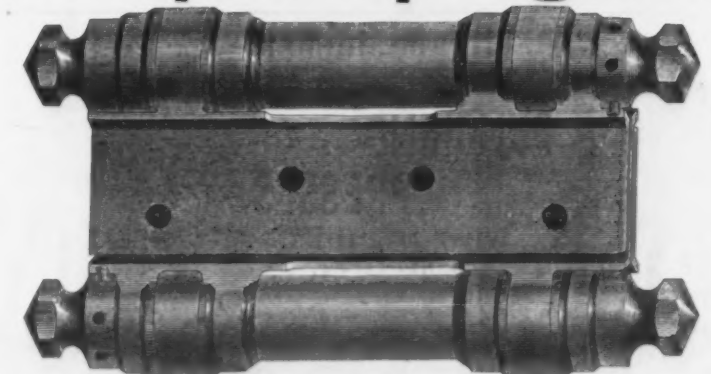
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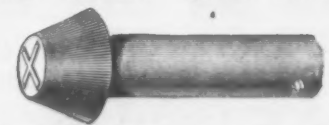
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